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## SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Jun Xu Examiner #: 77924 Date: 6-4-03  
 Art Unit: 1775 Phone Number 305-0395 Serial Number: 10/012,308  
 Mail Box and Bldg/Room Location: CP3-11028 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

\*\*\*\*\*

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: \_\_\_\_\_

Inventors (please provide full names): \_\_\_\_\_

Earliest Priority Filing Date: \_\_\_\_\_

\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

*We also performed a structural search for the product-by-process claim 13.*

*Closest art has been printed out first.*

## STAFF USE ONLY

Searcher: ED

Searcher Phone #: \_\_\_\_\_

Searcher Location: \_\_\_\_\_

Date Searcher Picked Up: \_\_\_\_\_

Date Completed: 6-6-03

Searcher Prep & Review Time: 10

Clerical Prep Time: \_\_\_\_\_

Online Time: 130

## Type of Search

NA Sequence (#) \_\_\_\_\_

AA Sequence (#) \_\_\_\_\_

Structure (#) \_\_\_\_\_

Bibliographic \_\_\_\_\_

Litigation \_\_\_\_\_

Fulltext \_\_\_\_\_

Patent Family \_\_\_\_\_

Other \_\_\_\_\_

## Vendors and cost where applicable

STN

\$528.84

Dialog

(6) subsets

Questel/Orbit

(and) Link

Lexis/Nexis

Sequence Systems

WWW/Internet

Other (specify) \_\_\_\_\_

95772

SEARCH REQUEST FORM

Scientific and Technical Information Center

Examiner# : 77924

Art Unit : 1775

Phone Number: 305-0395

Date: 6/4/2003

Serial Number: 10/042,308

MailBox & Bldg/Room Location: CP3 11d28

Results Format Preferred (circle) Paper Disk E-mail

SCIENTIFIC REFERENCE BR  
Sci. & Tech. Info. Cntr

JUN 4

Pat. & T.M. Office

If more than one search is submitted, please prioritize searches in order of need.

\*\*\*\*\*

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc., if known. Please attach a copy of the coversheet, pertinent claims, and abstract.

**Title of Invention:**

**Dielectric resin composition and multilayer circuit board comprising dielectric layers formed therefrom**

**Inventors (please provide full names):**

**Nawalage Florence Cooray**

**Earliest Priority Filing Date: 1/12/2001**

**\*For Sequence Searches Only\*** Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

Please search the dielectric resin composition as described in claims 1 and 9 and search the composition used in a multilayer circuit board, printed circuit board or wiring circuit board.

Please call me if you have any questions.

Thanks

Wg Ku

=> file reg

FILE 'REGISTRY' ENTERED AT 20:47:44 ON 06 JUN 2003  
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.  
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=> display history full ll-

FILE 'HCAPLUS' ENTERED AT 19:28:07 ON 06 JUN 2003

L1 20 SEA COORAY N?/AU  
L2 256802 SEA EPOXY OR EPOXIES OR EPOXID? OR POLYEPOX?  
L3 8650 SEA CYANATE# OR DICYANATE# OR TRICYANATE# OR TETRACYANATE  
# OR PENTACYANATE#  
L4 2342 SEA (POLYIMID## OR POLY(A)IMID##) (3A) (EPOXY OR EPOXIES  
OR EPOXID? OR POLYEPOX?)

FILE 'REGISTRY' ENTERED AT 19:31:26 ON 06 JUN 2003

E EPOXY RESIN/PCT  
L5 41195 SEA "EPOXY RESIN"/PCT  
E POLYIMIDE/PCT  
L6 48126 SEA POLYIMIDE/PCT  
E POLYAMIC ACID/PCT  
L7 29970 SEA "POLYAMIC ACID"/PCT

FILE 'HCAPLUS' ENTERED AT 19:34:26 ON 06 JUN 2003

L8 28 SEA (L5/D OR L5/DP) (3A) (EPOXID? OR POLYEPOX?)  
L9 26108 SEA L7 OR POLYAMIC# OR POLY(A)AMIC#  
L10 61064 SEA L6 OR POLYIMID## OR POLY(A)IMID##  
L11 264044 SEA L5 OR EPOXY OR EPOXIES OR EPOXID? OR POLYEPOX?  
L12 1 SEA L1 AND L3  
L13 180979 SEA (PRINT? OR ELEC# OR ELECTRIC? OR INTEGRA? OR  
BOARD?) (2A) CIRCUIT? OR PRINT? (2A) BOARD? OR IC OR ICS OR  
I(W)C OR (WIRE# OR WIRING#) (2A) (BOARD? OR HARNESS?) OR  
PCB OR PCBs OR P(W)C(W)B OR (ELEC# OR ELECTRONIC?) (3A) (PK  
G# OR PACKAG?)  
L14 60308 SEA DIELEC? (2A) (FILM? OR LAYER? OR COAT? OR RESIN? OR  
POLYMER? OR COPOLYMER? OR HOMOPOLYMER? OR TERPOLYMER?)  
SEL L12 1 RN

FILE 'REGISTRY' ENTERED AT 19:43:16 ON 06 JUN 2003

L15 31 SEA (13395-16-9/BI OR 200870-33-3/BI OR 459432-72-5/BI  
L16 12 SEA L15 AND PMS/CI  
D L16 1-12 IDE  
E POLYCYANURATE/PCT  
L17 1146 SEA POLYCYANURATE/PCT

FILE 'HCAPLUS' ENTERED AT 19:46:35 ON 06 JUN 2003

L18 5316 SEA L17 OR POLYCYANURATE# OR CYANURATE# OR DICYANURATE#  
OR TRICYANURATE# OR TETRACYANURATE# OR PENTACYANURATE#



FILE 'REGISTRY' ENTERED AT 19:46:42 ON 06 JUN 2003  
SEL L16 1-6 RN  
L19 6 SEA (459432-72-5/BI OR 459432-74-7/BI OR 459809-33-7/BI  
OR 459812-01-2/BI OR 459859-37-1/BI OR 459861-61-1/BI)

FILE 'HCAPLUS' ENTERED AT 19:48:58 ON 06 JUN 2003  
L20 1 SEA L19

FILE 'REGISTRY' ENTERED AT 19:49:14 ON 06 JUN 2003  
SEL L16 8 RN  
L21 1 SEA 200870-33-3/BI

FILE 'HCAPLUS' ENTERED AT 19:52:10 ON 06 JUN 2003  
L22 2 SEA L21

FILE 'REGISTRY' ENTERED AT 19:52:19 ON 06 JUN 2003  
SEL L16 10 RN  
L23 1 SEA 68508-55-4/BI  
SEL L16 11,12 RN  
L24 2 SEA (25085-98-7/BI OR 33294-14-3/BI)

FILE 'HCAPLUS' ENTERED AT 19:52:48 ON 06 JUN 2003  
L25 404 SEA L23  
L26 2862 SEA L24  
L27 34 SEA L25 AND L26

FILE 'REGISTRY' ENTERED AT 19:56:09 ON 06 JUN 2003  
L28 7 SEA L15 AND M/ELS  
L29 20503 SEA ?PENTANEDIONAT?/CNS  
L30 4 SEA L28 AND L29  
D L30 1 RSD  
L31 50722 SEA 833/RID  
L32 26029 SEA L31 AND M/ELS  
L33 20214 SEA L29 AND M/ELS  
L34 4 SEA L30 AND L32  
L35 4 SEA L30 AND L33  
L36 5234 SEA L32 AND L33

FILE 'HCAPLUS' ENTERED AT 20:00:57 ON 06 JUN 2003  
L37 4208 SEA L30  
L38 14028 SEA L36  
L39 41502 SEA L32 OR L33 OR ?ACETYLACETONAT? OR ACAC  
L40 4 SEA L27 AND (L37 OR L38 OR L39)  
L41 23 SEA L27 AND (L13 OR L14)  
L42 1 SEA L41 AND L4  
L43 0 SEA L41 AND L8  
L44 23 SEA L41 AND (L2 OR L11)  
L45 23 SEA L41 AND (L3 OR L18)  
L46 12 SEA L41 AND (L9 OR L10)  
L47 12 SEA L44 AND L45 AND L46

FILE 'LREGISTRY' ENTERED AT 20:09:46 ON 06 JUN 2003

L48 STR  
L49 STR  
L50 STR

FILE 'REGISTRY' ENTERED AT 20:12:14 ON 06 JUN 2003

L51 48226 SEA L6 OR L7  
L52 50 SEA SUB=L51 SSS SAM L48 AND L49 AND L50  
L53 2 SEA L16 AND 2/NC  
L54 1 SEA L16 AND 3/NC

FILE 'LREGISTRY' ENTERED AT 20:16:28 ON 06 JUN 2003

L55 STR L49  
L56 STR L50

FILE 'REGISTRY' ENTERED AT 20:19:10 ON 06 JUN 2003

L57 30 SEA SUB=L51 SSS SAM ((L49 AND L56) OR (L55 AND L50))  
L58 827 SEA SUB=L51 SSS FUL ((L49 AND L56) OR (L55 AND L50))  
SAV L58 XU308/A

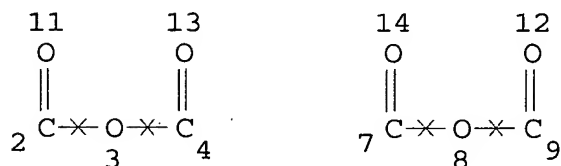
FILE 'HCAPLUS' ENTERED AT 20:20:30 ON 06 JUN 2003

L59 490 SEA L58  
L60 67 SEA L59 AND (L13 OR L14)  
L61 1 SEA L60 AND (L37 OR L38 OR L39)  
L62 4 SEA L59 AND (L37 OR L38 OR L39)  
L63 21 SEA L60 AND (L2 OR L11)  
L64 1 SEA L63 AND (L3 OR L18)  
L65 21 SEA L63 AND (L9 OR L10)  
L66 17 SEA L63 AND L4  
L67 0 SEA L63 AND L8  
L68 17 SEA L65 AND L66  
L69 6 SEA (L6/D OR L6/DP) (3A) (EPOXID? OR POLYEPOX?)  
L70 1 SEA L69 AND (L13 OR L14)  
L71 1760 SEA (L2 OR L11) AND (L3 OR L18)  
L72 569 SEA L71 AND (L13 OR L14)  
L73 30 SEA L72 AND (L37 OR L38 OR L39)  
L74 7 SEA L72 AND L37  
L75 2 SEA L73 AND L4  
L76 1 SEA L73 AND L9  
L77 4 SEA L73 AND L10  
L78 41 SEA L72 AND L4  
L79 16 SEA L72 AND L9  
L80 169 SEA L72 AND L10  
L81 6 SEA L78 AND L79 AND L80  
L82 167911 SEA (METAL#### OR COPPER# OR CU OR COBALT# OR CO OR  
ZINC# OR ZN OR MANGANESE# OR MN) (2A) (CAT# OR CATALY?)  
L83 27 SEA L72 AND L82  
L84 6 SEA L83 AND (L4 OR L9 OR L10)  
L85 2 SEA L59 AND L82  
L86 1 SEA L60 AND L82  
L87 3 SEA L27 AND L82

L88 26 SEA L20 OR L22 OR L40 OR L42 OR L61 OR L62 OR L64 OR L70  
OR L74 OR L75 OR L76 OR L77 OR L81 OR L84 OR L85 OR L86  
OR L87  
L89 11 SEA L47 NOT L88  
L90 16 SEA L66 NOT (L88 OR L89)  
L91 22 SEA L73 NOT (L88 OR L89 OR L90)

=> d 158 que stat

L6 48126 SEA FILE=REGISTRY POLYIMIDE/PCT  
L7 29970 SEA FILE=REGISTRY "POLYAMIC ACID"/PCT  
L49 STR



NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 10

STEREO ATTRIBUTES: NONE

L50 STR



NODE ATTRIBUTES:

NSPEC IS RC AT 2

NSPEC IS RC AT 4

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

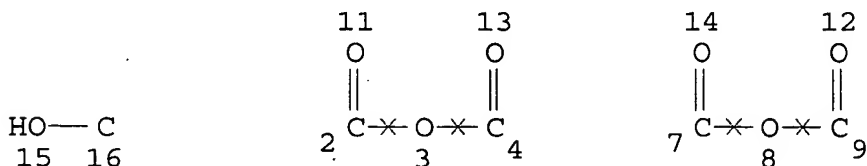
RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 4

STEREO ATTRIBUTES: NONE

L51 48226 SEA FILE=REGISTRY L6 OR L7

L55 STR



## NODE ATTRIBUTES:

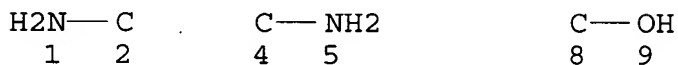
NSPEC IS RC AT 16  
DEFAULT MLEVEL IS ATOM  
DEFAULT ECLEVEL IS LIMITED

## GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED  
NUMBER OF NODES IS 12

## STEREO ATTRIBUTES: NONE

L56 STR



## NODE ATTRIBUTES:

NSPEC IS RC AT 2  
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NSPEC IS RC AT 8  
DEFAULT MLEVEL IS ATOM  
DEFAULT ECLEVEL IS LIMITED

## GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED  
NUMBER OF NODES IS 6

## STEREO ATTRIBUTES: NONE

L58 827 SEA FILE=REGISTRY SUB=L51 SSS FUL ((L49 AND L56) OR (L55 AND L50))

100.0% PROCESSED 23628 ITERATIONS  
SEARCH TIME: 00.00.01

827 ANSWERS

=> file hcaplus

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=> d l88 1-26 cbib abs hitstr hitind

L88 ANSWER 1 OF 26 HCAPLUS COPYRIGHT 2003 ACS

2003:117026 Document No. 138:178965 Fabrication of multilayer

**printed wiring board.** Takase,

Yoshihisa; Nakamura, Hisashi; Sugawa, Toshio (Matsushita Electric

Industrial Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2003046245

A2 20030214, 12 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP

2001-229183 20010730.

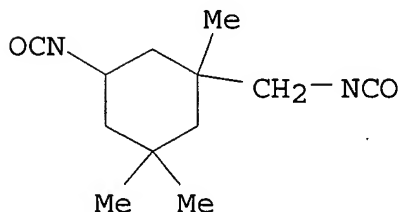
- AB A method for fabricating a multilayer **printed wiring board** involves forming a resin layer on a core board having a first wiring pattern, forming a Cu thin layer on the resin layer, forming blind via holes reaching the first wiring pattern, forming a Cu electroless plating layer after providing a **catalyst** to the Cu thin layer and blind via holes, forming a resist layer having a pattern corresponding to a second wiring pattern, forming the second wiring pattern as well as filling the blind via holes by electroplating of Cu, removing the resist layer, and removing the Cu electroless plating layer and catalyst by etching. Specifically, the resin layer may comprise an **epoxy resin, polyimide, polyether sulfone, bismaleimide-triazine resin, polyphenylene ether, polyethylene, polytetrafluoroethylene, polyetherimide, cyanate ester, and/or liq. crystal polymer**, and the second plating layer may comprise tin, nickel, gold, and/or tin/lead. The method is suitable for forming a fine pattern and small blind via holes.
- IC ICM H05K003-46  
ICS H05K003-46
- CC 76-2 (Electric Phenomena)
- ST multilayer **printed wiring board** copper  
electroless plating electroplating
- IT Polyamide fibers, uses  
(aramid; fabrication of multilayer **printed wiring board** by copper plating)
- IT Coating process  
(electroless; fabrication of multilayer **printed wiring board** by copper plating)
- IT **Dielectric films**  
Electrodeposition  
Liquid crystals, polymeric  
(fabrication of multilayer **printed wiring board** by copper plating)
- IT **Epoxy resins, uses**  
Fluoropolymers, uses  
Glass fibers, uses  
**Polycyanurates**  
Polyethers, uses  
**Polyimides, uses**  
Polyoxyphenylenes  
Polysulfones, uses  
(fabrication of multilayer **printed wiring board** by copper plating)
- IT **Printed circuit boards**  
(multilayer; fabrication of multilayer **printed wiring board** by copper plating)
- IT **Polyimides, uses**  
(polyether-; fabrication of multilayer **printed wiring board** by copper plating)
- IT Polyethers, uses  
(**polyimide-**; fabrication of multilayer **printed wiring board** by copper plating)

- IT 7440-50-8, Copper, processes  
(fabrication of multilayer **printed wiring board** by copper plating)
- IT 7439-92-1, Lead, uses 7440-02-0, Nickel, uses 7440-31-5, Tin, uses 7440-57-5, Gold, uses 9002-84-0, Polytetrafluoroethylene 9002-88-4, Polyethylene  
(fabrication of multilayer **printed wiring board** by copper plating)
- L88 ANSWER 2 OF 26 HCAPLUS COPYRIGHT 2003 ACS  
2002:808039 Document No. 137:311758 Polyfunctional **cyanate** polymer adhesive composition for **printed circuit board** with good adhesion. Yamada, Toshiaki; Ban, Hajime; Ikeda, Hibiki (Mitsubishi Gas Chemical Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002309086 A2 20021023, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-114034 20010412.
- AB The compn. comprises a polyfunctional **cyanate** or it polymer contg. silicon-contg. **polyimide** 0.1-5 and a thermosetting catalyst 0.005-5 phr, wherein the cycloimido cyclization rate of th **polyimide** satisfies with given condition. Thus, a compn. was made from a prepolymer of 2,2-bis(4-cyanatophenyl)propane and 1,4-dicyanatobenzene, a **polyimide** of pyromellitic dianhydride, IPDI, 1,3-bis(3-aminopropyl)tetramethyldisiloxane, and ESCN 220F thermosetting catalyst.
- IT 471910-27-7 471910-28-8  
(polyfunctional **cyanate** polymer adhesive compn. for **printed circuit board** with good adhesion)
- RN 471910-27-7 HCAPLUS
- CN Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, polymer with 1H,3H-benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, 5-isocyanato-1-(isocyanatomethyl)-1,3,3-trimethylcyclohexane and 3,3'-(1,1,3,3-tetramethyl-1,3-disiloxanediyl)bis[1-propanamine] (9CI) (CA INDEX NAME)

CM 1

CRN 4098-71-9

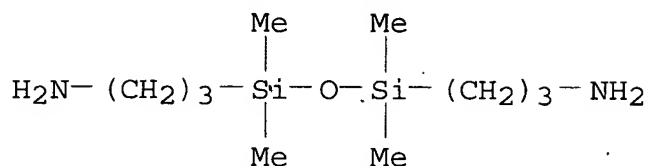
CMF C12 H18 N2 O2



CM 2

CRN 2469-55-8

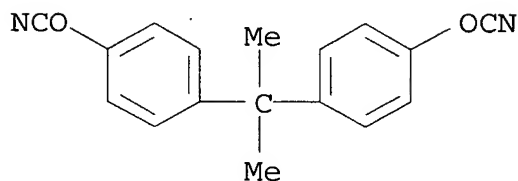
CMF C10 H28 N2 O Si2



CM 3

CRN 1156-51-0

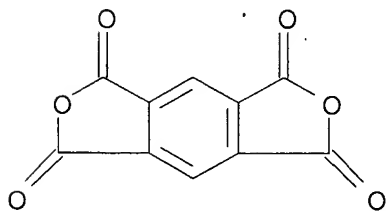
CMF C17 H14 N2 O2



CM 4

CRN 89-32-7

CMF C10 H2 O6

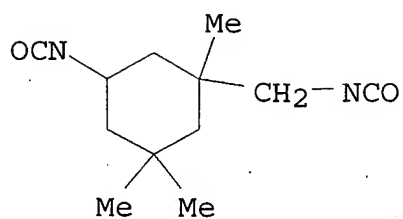


RN 471910-28-8 HCAPLUS

CN Cyanic acid, 1,4-phenylene ester, polymer with 5,5'-carbonylbis[1,3-isobenzofurandione], 5-isocyanato-1-(isocyanatomethyl)-1,3,3-trimethylcyclohexane and 3,3'-(1,1,3,3-tetramethyl-1,3-disiloxanediyl)bis[1-propanamine] (9CI) (CA INDEX NAME)

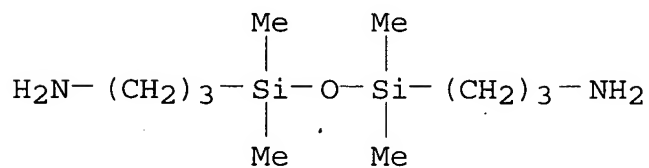
CM 1

CRN 4098-71-9  
CMF C12 H18 N2 O2



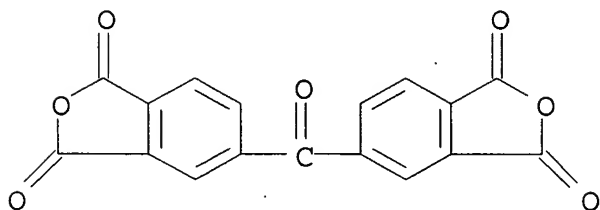
CM 2

CRN 2469-55-8  
CMF C10 H28 N2 O Si2



CM 3

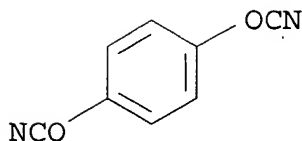
CRN 2421-28-5  
CMF C17 H6 O7



CM 4

CRN 1129-80-2  
CMF C8 H4 N2 O2

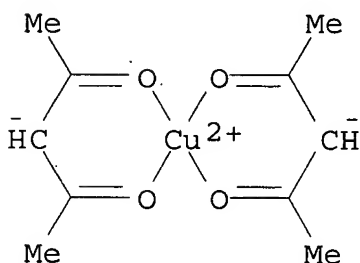




- IC ICM C08L079-04  
ICS C08G073-10; C08L079-08; H01L023-14; H05K001-03
- CC 37-6 (Plastics Manufacture and Processing)  
Section cross-reference(s): 76
- ST **polyimide** polysiloxane thermosetting adhesive  
**circuit board**; **epoxy** polymn catalyst  
**polyimide** polysiloxane
- IT Polymerization catalysts  
**Printed circuit boards**  
(polyfunctional **cyanate** polymer adhesive compn. for  
**printed circuit board** with good  
adhesion)
- IT Polysiloxanes, properties  
(**polyimide**-; polyfunctional **cyanate** polymer  
adhesive compn. for **printed circuit**  
**board** with good adhesion)
- IT **Polyimides**, properties  
(polysiloxane-; polyfunctional **cyanate** polymer adhesive  
compn. for **printed circuit board**  
with good adhesion)
- IT Adhesives  
(thermosetting; polyfunctional **cyanate** polymer adhesive  
compn. for **printed circuit board**  
with good adhesion)
- IT 84593-73-7, ESCN 220F  
(polyfunctional **cyanate** polymer adhesive compn. for  
**printed circuit board** with good  
adhesion)
- IT 471910-27-7 471910-28-8  
(polyfunctional **cyanate** polymer adhesive compn. for  
**printed circuit board** with good  
adhesion)
- L88 ANSWER 3 OF 26 HCAPLUS COPYRIGHT 2003 ACS  
2002:716823 Document No. 137:240935 **Dielectric resin**  
composition and multilayer **circuit board** or  
**electronic package** comprising **dielectric**  
**layers** formed from the resin. Cooray, Nawalage Florence  
(Fujitsu Limited, Japan). U.S. Pat. Appl. Publ. US 2002131247 A1  
20020919, 9 pp. (English). CODEN: USXXCO. APPLICATION: US  
2002-42308 20020111. PRIORITY: JP 2001-5369 20010112; JP  
2001-183776 20010618.
- AB A dielec. resin compn. which forms  
**polymeric dielec. films** with excellent

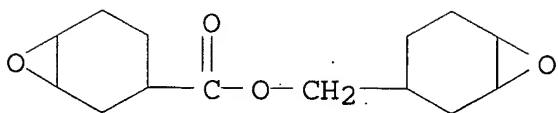
mech., thermal and elec. properties and good moisture resistance for **circuit boards** or as an **electronic packaging** material is claimed. The **dielec. resin** compn. comprises at least one type of **epoxy** resin and at least one type of **cyanate** ester which would react with said **epoxy** resin, together with a **metal ion catalyst** system, the ratio of the **epoxy** functional groups of said **epoxy** resin to the **cyanate** groups of said **cyanate** ester being in the range of from 1:0.8 to 1:1.4. Alternatively, a **dielec. resin** compn. according to the invention may comprise a **polyimide** resin with side chain **epoxy** groups, a **cyanate** ester with two or more **cyanate** groups in the mol., and a **metal ion catalyst** system. A multilayer **circuit board** having a multilayer structure comprising a core substrate and a required no. of **dielec. layers** and wiring layers stacked alternately, wherein at least one of the **dielec. layers** is formed from a **dielec. resin** compn. of the invention, is also disclosed.

- IT 13395-16-9, Copper(II) **acetylacetonate** (dielec. resin compn. and multilayer **circuit board** or **electronic package** comprising **dielec. layers** formed from resin contg.)
- RN 13395-16-9 HCAPLUS
- CN Copper, bis(2,4-pentanedionato-.kappa.O,.kappa.O')-, (SP-4-1)- (9CI) (CA INDEX NAME)



- IT 25085-98-7, Araldite CY 179 33294-14-3, Epiclon 153 459809-33-7, BEO 6E (dielec. resin compn. and multilayer **circuit board** or **electronic package** comprising **dielec. layers** formed from resin contg.)
- RN 25085-98-7 HCAPLUS
- CN 7-Oxabicyclo[4.1.0]heptane-3-carboxylic acid, 7-oxabicyclo[4.1.0]hept-3-ylmethyl ester, homopolymer (9CI) (CA INDEX NAME)

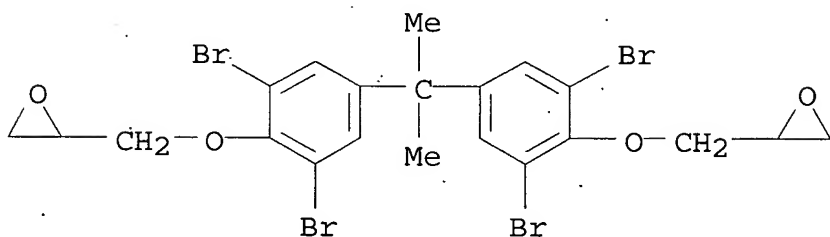
CRN 2386-87-0  
CMF C14 H20 O4



RN 33294-14-3 HCAPLUS  
CN Oxirane, 2,2'-[(1-methylethylidene)bis[(2,6-dibromo-4,1-phenylene)oxymethylene]]bis-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 3072-84-2  
CMF C21 H20 Br4 O4



RN 459809-33-7 HCAPLUS  
CN BEO 6E (9CI) (CA INDEX NAME)

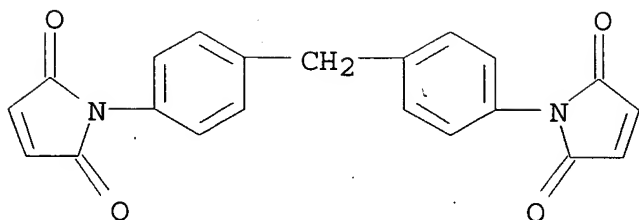
\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

IT 68508-55-4, BT resin  
(dielec. resin compn. and multilayer  
circuit board or electronic  
package comprising dielec. layers  
formed from resin prepd. with)

RN 68508-55-4 HCAPLUS  
CN Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, polymer  
with 1,1'-(methylenedi-4,1-phenylene)bis[1H-pyrrole-2,5-dione] (9CI)  
(CA INDEX NAME)

CM 1

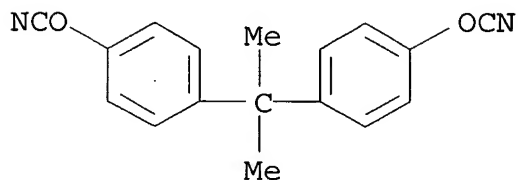
CRN 13676-54-5  
CMF C21 H14 N2 O4



CM 2

CRN 1156-51-0

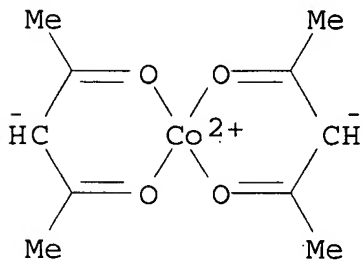
CMF C17 H14 N2 O2



IT 14024-48-7, Cobalt(II) **acetylacetonate**  
 14024-58-9, Manganese(II) **acetylacetonate**  
 14024-63-6, Zinc **acetylacetonate**  
 (dielec. resin compn. and multilayer  
 circuit board or electronic  
 package comprising dielec. layers  
 formed from resin with polymn. catalyst from)

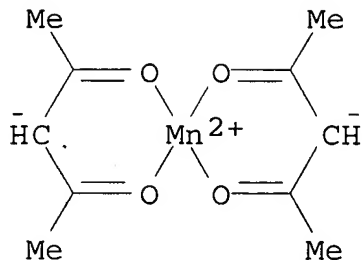
RN 14024-48-7 HCAPLUS

CN Cobalt, bis(2,4-pentanedionato-.kappa.O,.kappa.O')-, (SP-4-1) - (9CI)  
 (CA INDEX NAME)



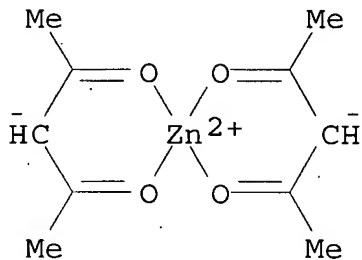
RN 14024-58-9 HCAPLUS

CN Manganese, bis(2,4-pentanedionato-.kappa.O,.kappa.O')- (9CI) (CA  
 INDEX NAME)



RN 14024-63-6 HCAPLUS

CN Zinc, bis(2,4-pentanedionato-.kappa.O,.kappa.O')-, (T-4)- (9CI) (CA INDEX NAME)



IT 459432-72-5DP, epoxy-modified, reaction products with PT-30, copper bis(acetylacetonate), and dimethylimidazolidinone 459432-72-5P, 4,4'-Diamino-4''-hydroxytriphenylmethane-4,4'-Oxydiphthalic anhydride copolymer 459432-74-7P 459861-61-1P (in prepn. of dielec. resin)

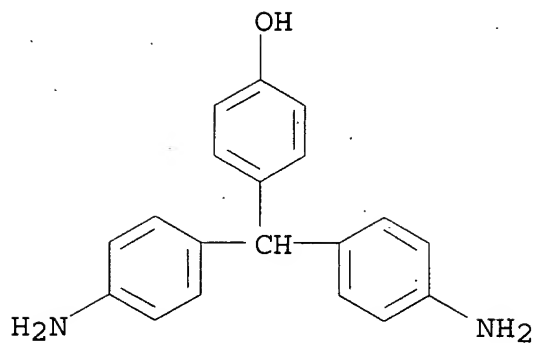
RN 459432-72-5 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-oxybis-, polymer with 4-[bis(4-aminophenyl)methyl]phenol (9CI) (CA INDEX NAME)

CM 1

CRN 110146-05-9

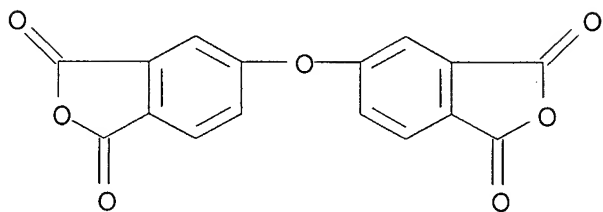
CMF C19 H18 N2 O



CM 2

CRN 1823-59-2

CMF C16 H6 O7



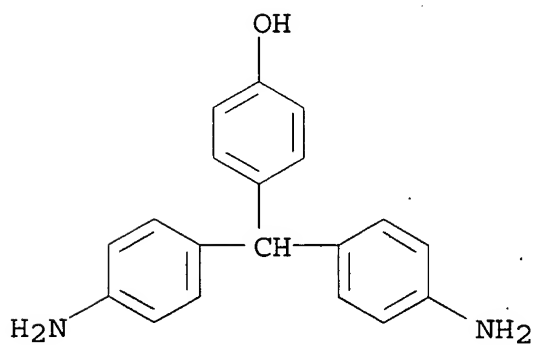
RN 459432-72-5 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-oxybis-, polymer with  
4-[bis(4-aminophenyl)methyl]phenol (9CI) (CA INDEX NAME)

CM 1

CRN 110146-05-9

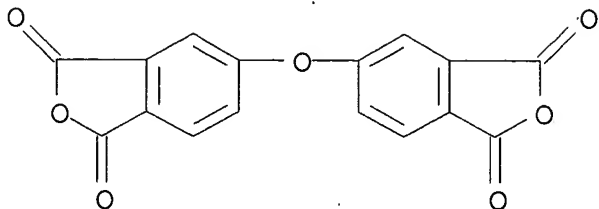
CMF C19 H18 N2 O



CM 2

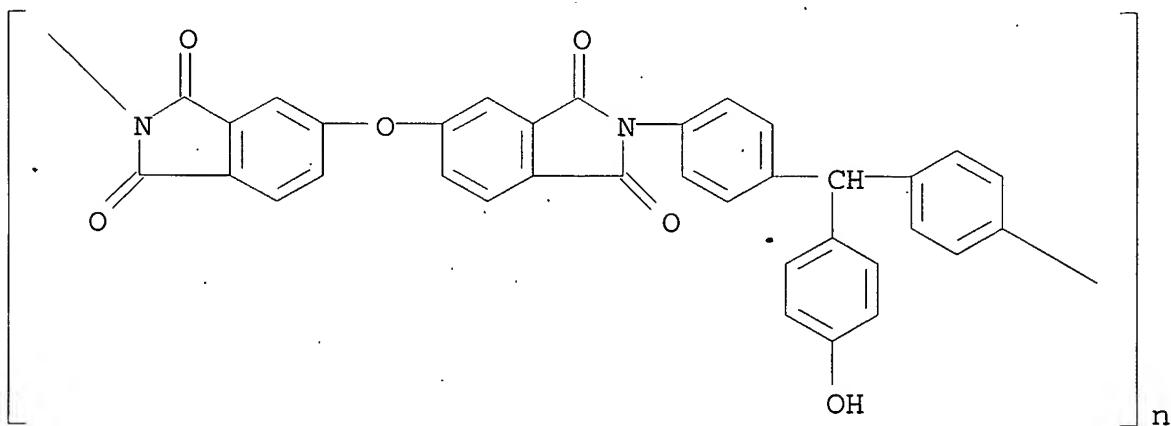
CRN 1823-59-2

CMF C16 H6 O7



RN 459432-74-7 HCAPLUS

CN Poly[(1,3-dihydro-1,3-dioxo-2H-isoindole-2,5-diyl)oxy(1,3-dihydro-1,3-dioxo-2H-isoindole-5,2-diyl)-1,4-phenylene[(4-hydroxyphenyl)methylene]-1,4-phenylene] (9CI) (CA INDEX NAME)



RN 459861-61-1 HCAPLUS

CN Poly[oxy(carboxyphenylene)carbonylimino-1,4-phenylene[(4-hydroxyphenyl)methylene]-1,4-phenyleneiminocarbonyl(carboxyphenylene)] (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

IT 200870-33-3P 459859-37-1P

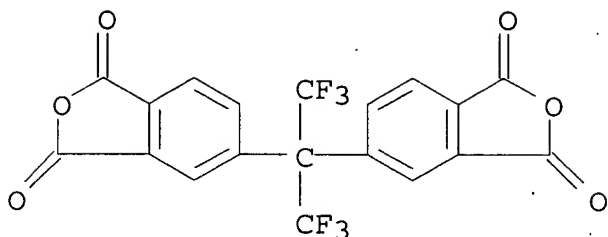
(in prepn. of dielec. resin compn.)

RN 200870-33-3 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis-, polymer with 2,4-diaminophenol dihydrochloride (9CI) (CA INDEX NAME)

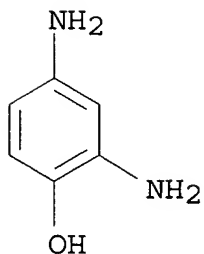
CM 1

CRN 1107-00-2  
CMF C19 H6 F6 O6



CM 2

CRN 137-09-7  
CMF C6 H8 N2 O . 2 Cl H



2 HCl

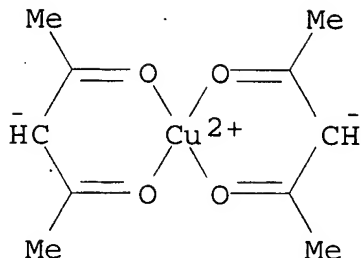
RN 459859-37-1 HCAPLUS  
CN Poly[imino(hydroxy-1,3-phenylene)iminocarbonyl(carboxyphenylene)[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene](carboxyphenylene)carbonyl] (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

IT 13395-16-9DP, Copper bis(acetylacetonate),  
reaction products with PT-30, dimethylimidazolidinone, and  
**epoxy-modified polyimides**  
(properties of dielec. film from)

RN 13395-16-9 HCAPLUS  
CN Copper, bis(2,4-pentanedionato-.kappa.O,.kappa.O')-, (SP-4-1)- (9CI)  
(CA INDEX NAME)





IT 459812-01-2P, Epiclon 153-Araldite CY 179-BEO-6E-PT-30  
copolymer

(properties of dielec. film from)

RN 459812-01-2 HCAPLUS

CN 7-Oxabicyclo[4.1.0]heptane-3-carboxylic acid, 7-oxabicyclo[4.1.0]hept-3-ylmethyl ester, polymer with BEO 6E, 2,2'-[(1-methylethylidene)bis[(2,6-dibromo-4,1-phenylene)oxymethylene]]bis[oxirane] and Primaset PT 30 (9CI) (CA INDEX NAME)

CM 1

CRN 459809-33-7

CMF Unspecified

CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 2

CRN 173452-35-2

CMF Unspecified

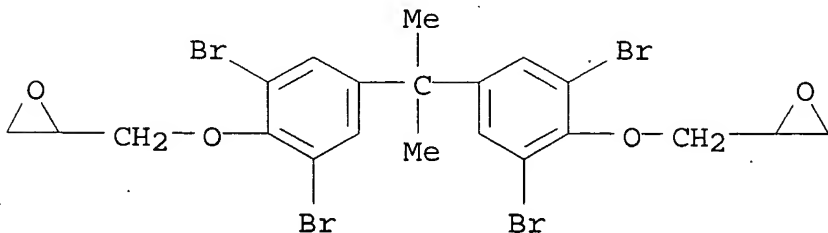
CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 3

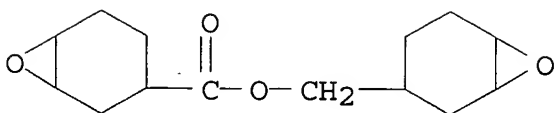
CRN 3072-84-2

CMF C21 H20 Br4 O4



CM 4

CRN 2386-87-0  
 CMF C14 H20 O4



IT 200870-33-3DP, epoxy-modified

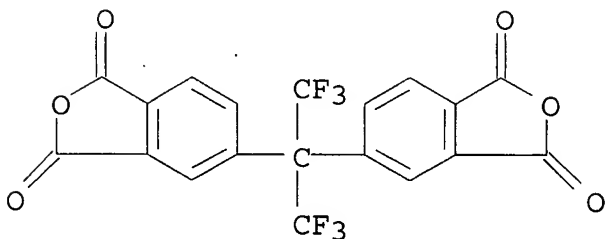
(varnish; in prepn. of dielec. resin compn.)

RN 200870-33-3 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis-, polymer with 2,4-diaminophenol dihydrochloride (9CI) (CA INDEX NAME)

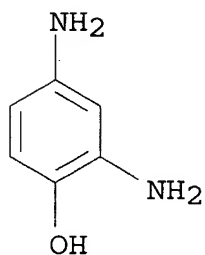
CM 1

CRN 1107-00-2  
 CMF C19 H6 F6 O6



CM 2

CRN 137-09-7  
 CMF C6 H8 N2 O . 2 Cl H



2 HCl

IC ICM H05K001-00  
 NCL 361750000  
 CC 76-14 (Electric Phenomena)  
 Section cross-reference(s): 35, 38  
 ST **dielec resin film circuit**  
**board electronic package; epoxy**  
**resin dielec film**  
 IT **Epoxy resins, uses**  
 (alicyclic; **dielec. resin compn. and**  
**multilayer circuit board or**  
**electronic package comprising dielec.**  
**layers formed from)**  
 IT **Epoxy resins, uses**  
 (arom. **epoxy resins; dielec.**  
**resin compn. and multilayer circuit**  
**board or electronic package**  
**comprising dielec. layers formed from)**  
 IT **Polyimides, processes**  
 (bismaleimide-based, triazine group-contg., triazine;  
**dielec. resin compn. and multilayer**  
**circuit board or electronic**  
**package comprising dielec. layers**  
**formed from resin prepd. with)**  
 IT **Polyesters, uses**  
 (cyanate resins; **dielec.**  
**resin compn. and multilayer circuit**  
**board or electronic package**  
**comprising dielec. layers formed from resin)**  
 IT **Amines, processes**  
 (diamines; **dielec. resin compn. and**  
**multilayer circuit board or**  
**electronic package comprising dielec.**  
**layers formed from resin prepd. with)**  
 IT **Anhydrides**  
 (dianhydrides, tetracarboxylic acid; **dielec.**  
**resin compn. and multilayer circuit**

- board or electronic package  
comprising dielec. layers formed from resin  
prepd. with)
- IT Dielectric films  
Electronic packaging materials  
(dielec. resin compn. and multilayer  
circuit board or electronic  
package comprising dielec. layers  
formed from resin)
- IT Epoxy resins, uses  
(dielec. resin compn. and multilayer  
circuit board or electronic  
package comprising dielec. layers  
formed from resin)
- IT Acrylic polymers, uses  
(dielec. resin compn. and multilayer  
circuit board or electronic  
package comprising dielec. layers  
formed from resin contg.)
- IT Thixotropic agents  
(dielec. resin compn. and multilayer  
circuit board or electronic  
package comprising dielec. layers  
formed from resin with)
- IT Cyanates  
(ester resins; dielec. resin compn.  
and multilayer circuit board or  
electronic package comprising dielec.  
layers formed from resin)
- IT Polymerization catalysts  
(metal ion; dielec. resin compn.  
and multilayer circuit board or  
electronic package comprising dielec.  
layers formed from resin contg.)
- IT Printed circuit boards  
(multilayer; dielec. resin compn. and  
multilayer circuit board or  
electronic package comprising dielec.  
layers formed from resin)
- IT Polyethers, processes  
(polyamic acid-; dielec. resin  
compn. and multilayer circuit board or  
electronic package comprising dielec.  
layers formed from resin prepd. with)
- IT Polyimides, uses  
(polyether-; dielec. resin compn. and  
multilayer circuit board or  
electronic package comprising dielec.  
layers formed from resin of)
- IT Polyamic acids  
(polyether-; dielec. resin compn. and  
multilayer circuit board or

- electronic package comprising dielec. layers formed from resin prepd. with)
- IT Polyethers, uses  
(polyimide-; dielec. resin compn. and multilayer circuit board or electronic package comprising dielec. layers formed from resin of)
- IT Polymer chains  
(side; dielec. resin compn. and multilayer circuit board or electronic package comprising dielec. layers formed from resin contg.)
- IT 11099-25-5  
(coating of polymer dielec. film with)
- IT 13395-16-9, Copper(II) acetylacetonate  
(dielec. resin compn. and multilayer circuit board or electronic package comprising dielec. layers formed from resin contg.)
- IT 7631-86-9, Silica, uses 25085-98-7, Araldite CY 179  
33294-14-3, Epiclon 153 173452-35-2, Lonza PT 30  
459809-33-7, BEO 6E  
(dielec. resin compn. and multilayer circuit board or electronic package comprising dielec. layers formed from resin contg.)
- IT 7429-90-5, Aluminum, uses 7440-50-8, Copper, uses  
(dielec. resin compn. and multilayer circuit board or electronic package comprising dielec. layers formed from resin on).
- IT 68508-55-4, BT resin  
(dielec. resin compn. and multilayer circuit board or electronic package comprising dielec. layers formed from resin prepd. with)
- IT 108-94-1, Cyclohexanone, uses 84540-57-8, Propyleneglycol monomethyl ether acetate  
(dielec. resin compn. and multilayer circuit board or electronic package comprising dielec. layers formed from resin using)
- IT 14024-48-7, Cobalt(II) acetylacetonate  
14024-58-9, Manganese(II) acetylacetonate  
14024-63-6, Zinc acetylacetonate  
(dielec. resin compn. and multilayer circuit board or electronic package comprising dielec. layers formed from resin with polymn. catalyst from)
- IT 1823-59-2 110146-05-9, 4,4'-Diamino-4''-hydroxytriphenylmethane  
(in prepn. of dielec. resin)

- IT 56-93-9P, Benzyltrimethylammonium chloride 80-73-9DP, 1,3-Dimethyl-2-imidazolidinone, reaction products with PT-30, copper bis(**acetylacetonate**), and **epoxy**-modified **polyimides** 106-89-8P, Epichlorohydrin, processes **459432-72-5DP**, **epoxy**-modified, reaction products with PT-30, copper bis(**acetylacetonate**), and dimethylimidazolidinone **459432-72-5P**, 4,4'-Diamino-4''-hydroxytriphenylmethane-4,4'-Oxydiphthalic anhydride copolymer **459432-74-7P 459861-61-1P** (in prepn. of **dielec. resin**)
- IT 137-09-7, 2,4-Diaminophenol dihydrochloride 1107-00-2 (in prepn. of **dielec. resin** compn.)
- IT **200870-33-3P** 200960-59-4P **459859-37-1P** (in prepn. of **dielec. resin** compn.)
- IT 459811-20-2, AZ-PLP 30 (photoresist for photolithog. of **dielec. polymer film**)
- IT **13395-16-9DP**, Copper bis(**acetylacetonate**), reaction products with PT-30, dimethylimidazolidinone, and **epoxy**-modified **polyimides** (properties of **dielec. film** from)
- IT **459812-01-2P**, Epiclon 153-Araldite CY 179-BEO-6E-PT-30 **copolymer** (properties of **dielec. film** from)
- IT 80-73-9, 1,3-Dimethyl-2-imidazolidinone (solvent for varnish; properties of **dielec. film** from)
- IT 872-50-4P, N-Methylpyrrolidone, processes (solvent; in prepn. of **dielec. resin**)
- IT **200870-33-3DP**, **epoxy**-modified (varnish; in prepn. of **dielec. resin** compn.)

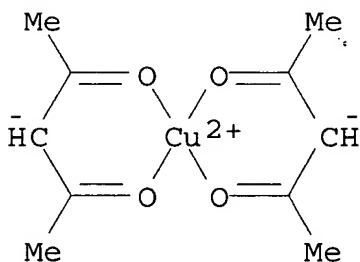
L88 ANSWER 4 OF 26 HCAPLUS COPYRIGHT 2003 ACS

2002:595290 Document No. 137:148921 Encapsulant composition and **electronic package** utilizing same. Papathomas, Konstantinos I. (International Business Machines Corporation, USA). U.S. Pat. Appl. Publ. US 2002105093 A1 20020808, 11 pp. (English). CODEN: USXXCO. APPLICATION: US 2001-778996 20010207.

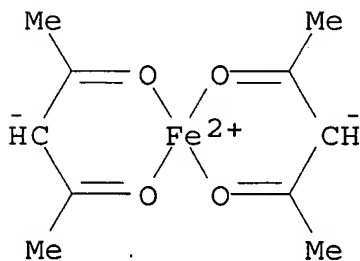
AB This invention relates to a compn. such as may be used for encapsulating a semiconductor chip on a substrate as part of an **electronic package**. A compn. is presented for use in making an encapsulant usable in the encapsulation of a semiconductor chip assembled to a substrate with C4 solder interconnections, which in turn may form part of an **electronic package**. The compn. comprises a resin, a flexibilizing agent and a filler material. In accordance with the teachings of this invention, there is provided a new compn. for use as an encapsulant in the manuf. of a chip carrier usable as part of an **electronic package**. In 1 embodiment, this encapsulant compn. comprises a resin material, a flexibilizing agent, and a filler material. It has been discovered that when this compn. is used in the assembly of a semiconductor chip onto a

carrier to make a chip carrier, it results in a chip carrier package having improved operational field life. Specifically, during accelerated thermal cycling from between .apprx.-65.degree. to .apprx.125.degree. hair-line cracks may form along the corners of encapsulated semiconductor chips or in a plane between the encapsulant and the chip passivation layer. Such cracks, once initiated, can grow during thermal cycling and result in catastrophic failure of the solder interconnections between the semiconductor chip and carrier to which it is assembled, decreasing the operational field life of the **electronic package**. The current encapsulant compn. provides improved operational field life by substantially preventing the formation of such cracks.

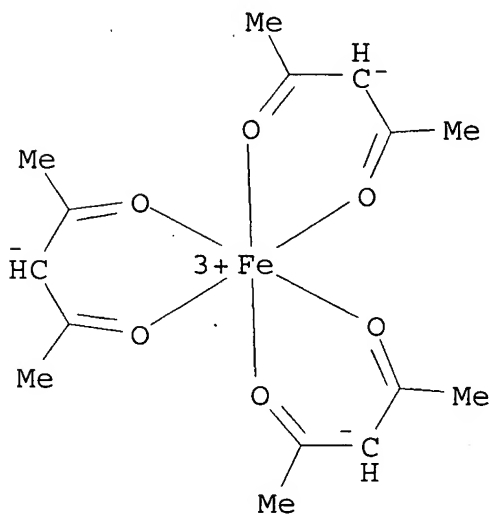
- IT 13395-16-9, Copper Acetylacetonate  
 14024-17-0, Iron Acetylacetonate  
 14024-18-1, Iron Acetylacetonate  
 14024-48-7 14024-63-6, Zinc  
 Acetylacetonate 14284-89-0, Manganese  
 Acetylacetonate 21679-46-9, Cobalt  
 Acetylacetonate  
 (catalyst; encapsulant compn. and **electronic package** utilizing same)
- RN 13395-16-9 HCAPLUS
- CN Copper, bis(2,4-pentanedionato-.kappa.O,.kappa.O')-, (SP-4-1)- (9CI)  
 (CA INDEX NAME)



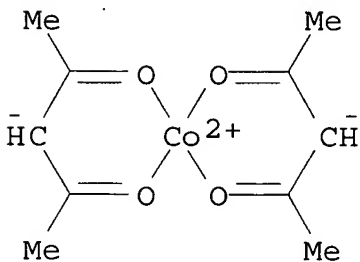
- RN 14024-17-0 HCAPLUS
- CN Iron, bis(2,4-pentanedionato-.kappa.O,.kappa.O')- (9CI) (CA INDEX NAME)



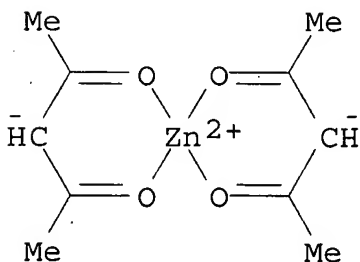
RN 14024-18-1 HCAPLUS

CN Iron, tris(2,4-pentanedionato-.kappa.O,.kappa.O')-, (OC-6-11) - (9CI)  
(CA INDEX NAME)

RN 14024-48-7 HCAPLUS

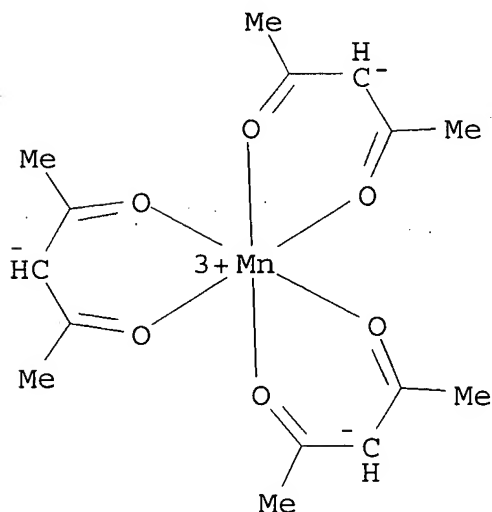
CN Cobalt, bis(2,4-pentanedionato-.kappa.O,.kappa.O')-, (SP-4-1) - (9CI)  
(CA INDEX NAME)

RN 14024-63-6 HCAPLUS

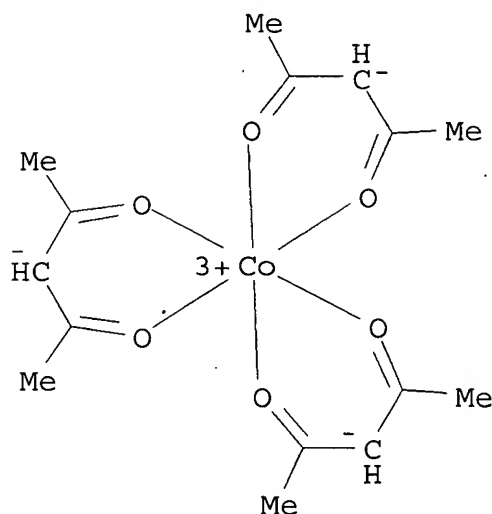
CN Zinc, bis(2,4-pentanedionato-.kappa.O,.kappa.O')-, (T-4) - (9CI) (CA  
INDEX NAME)



RN 14284-89-0 HCAPLUS

CN Manganese, tris(2,4-pentanedionato-.kappa.O,.kappa.O')-, (OC-6-11) -  
(9CI) (CA INDEX NAME)

RN 21679-46-9 HCAPLUS

CN Cobalt, tris(2,4-pentanedionato-.kappa.O,.kappa.O')-, (OC-6-11) -  
(9CI) (CA INDEX NAME)

IC ICM H01L023-48

ICS H01L023-52; H01L029-40; H01L023-29

NCL 257778000

CC 76-14 (Electric Phenomena)

Section cross-reference(s): 38, 67

ST **electronic packaging** material process resin  
filler catalyst

IT **Epoxides**  
(alicyclic, resin **electronic packaging**  
material; encapsulant compn. and **electronic**  
**package** utilizing same)

IT Polyesters, uses  
Polyethers, uses  
(arom., **electronic packaging** material  
flexibilizing agent; encapsulant compn. and **electronic**  
**package** utilizing same)

IT Polymers, uses  
(benzoxazine-based, **epoxy** resin, catalyst; encapsulant  
compn. and **electronic package** utilizing same)

IT EPDM rubber  
(carboxylated, **electronic packaging** material  
flexibilizing agent; encapsulant compn. and **electronic**  
**package** utilizing same)

IT **Epoxy** resins, uses  
Fluoropolymers, uses  
(catalyst; encapsulant compn. and **electronic**  
**package** utilizing same)

IT Naphthenic acids, uses  
(cobalt salts, catalyst; encapsulant compn.  
and **electronic package** utilizing same)

IT Naphthenic acids, uses  
(copper salts, catalyst; encapsulant compn.  
and **electronic package** utilizing same)

IT Glycols, uses  
(diepoxides, **electronic packaging** material  
flexibilizing agent; encapsulant compn. and **electronic**  
**package** utilizing same)

IT Butyl rubber, uses  
EPDM rubber  
Fluoro rubber  
Neoprene rubber, uses  
Polycarbonates, uses  
Polyesters, uses  
Polysiloxanes, uses  
Polyurethanes, uses  
(**electronic packaging** material flexibilizing  
agent; encapsulant compn. and **electronic**  
**package** utilizing same)

IT **Electronic packages**  
**Electronic packaging** materials  
**Electronic packaging** process  
Fillers  
Interconnections, electric  
Soldering  
(encapsulant compn. and **electronic package**  
utilizing same)

IT Polybenzoxazoles

- (epoxy resin, catalyst; encapsulant compn. and **electronic package** utilizing same)
- IT Polyimides, uses  
Polysulfones, uses  
Polythioarylenes  
(epoxy, catalyst; encapsulant compn. and **electronic package** utilizing same)
- IT Synthetic rubber, uses  
(epoxy, **electronic packaging** material flexibilizing agent; encapsulant compn. and **electronic package** utilizing same)
- IT Polyimides, uses  
Polyketones  
(epoxy-polyether-, catalyst; encapsulant compn. and **electronic package** utilizing same)
- IT Polyethers, uses  
(epoxy-polyimide-, catalyst; encapsulant compn. and **electronic package** utilizing same)
- IT Polyethers, uses  
(epoxy-polyketone-, catalyst; encapsulant compn. and **electronic package** utilizing same)
- IT Epoxy resins, uses  
(esters, **electronic packaging** material flexibilizing agent; encapsulant compn. and **electronic package** utilizing same)
- IT Nonwoven fabrics  
(fibers; encapsulant compn. and **electronic package** utilizing same)
- IT Zirconates  
(filler; encapsulant compn. and **electronic package** utilizing same)
- IT Synthetic rubber, uses  
(glycidyl ester, **electronic packaging** material flexibilizing agent; encapsulant compn. and **electronic package** utilizing same)
- IT Polyoxyalkylenes, uses  
(glycidyl ethers, **electronic packaging** material flexibilizing agent; encapsulant compn. and **electronic package** utilizing same)
- IT Ethers, uses  
(glycidyl, resin **electronic packaging** material; encapsulant compn. and **electronic package** utilizing same)
- IT Polysulfones, uses  
(hydroxy-terminated oligomers, **electronic packaging** material flexibilizing agent; encapsulant compn. and **electronic package** utilizing same)
- IT Naphthenic acids, uses  
(iron salts, catalyst; encapsulant compn. and **electronic package** utilizing same)
- IT Synthetic rubber, uses  
(maleated, **electronic packaging** material

- flexibilizing agent; encapsulant compn. and **electronic package** utilizing same)
- IT Naphthenic acids, uses  
(**manganese** salts, **catalyst**; encapsulant compn. and **electronic package** utilizing same)
- IT **Polyimides**, uses  
(polyamide-, **electronic packaging** material . .  
flexibilizing agent; encapsulant compn. and **electronic package** utilizing same)
- IT Polybenzothiazoles  
(polybenzobisthiazoles, polyphenyl-, **epoxy** resin, **catalyst**; encapsulant compn. and **electronic package** utilizing same)
- IT **Polyimides**, uses  
(polyether-, **electronic packaging** material  
flexibilizing agent; encapsulant compn. and **electronic package** utilizing same)
- IT **Epoxy** resins, uses  
(polyether-polyimide-, **catalyst**; encapsulant compn. and **electronic package** utilizing same)
- IT **Epoxy** resins, uses  
(polyether-polyketone-, **catalyst**; encapsulant compn. and **electronic package** utilizing same)
- IT Castor oil  
(polyglycidyl ethers, **electronic packaging** material flexibilizing agent; encapsulant compn. and **electronic package** utilizing same)
- IT **Epoxy** resins, uses  
(polyimide-, **catalyst**; encapsulant compn. and **electronic package** utilizing same)
- IT Polyamides, uses  
Polyethers, uses  
(polyimide-, **electronic packaging** material flexibilizing agent; encapsulant compn. and **electronic package** utilizing same)
- IT Polyquinoxalines  
(polyphenylquinoxalines, **epoxy** resin, **catalyst**; encapsulant compn. and **electronic package** utilizing same)
- IT **Epoxy** resins, uses  
(polysulfone-, **catalyst**; encapsulant compn. and **electronic package** utilizing same)
- IT **Epoxy** resins, uses  
(polythioarylene-, **catalyst**; encapsulant compn. and **electronic package** utilizing same)
- IT **Polycyanurates**  
(resin **electronic packaging** material, **catalyst**; encapsulant compn. and **electronic package** utilizing same)
- IT Hydrocarbons, uses  
(resin **electronic packaging** material; encapsulant compn. and **electronic package**

- utilizing same)
- IT Amines, uses  
(tertiary, catalyst; encapsulant compn. and **electronic package** utilizing same)
- IT Naphthenic acids, uses  
(**zinc** salts, **catalyst**; encapsulant compn. and **electronic package** utilizing same)
- IT 9010-85-9  
(butyl rubber, **electronic packaging** material flexibilizing agent; encapsulant compn. and **electronic package** utilizing same)
- IT 97-84-7, 1,3-Tetramethylbutane diamine 103-83-3, Benzyldimethylamine 110-86-1, Pyridine, uses 127-09-3, Sodium acetate 136-52-7, **Cobalt** Octoate 144-55-8, Sodium bicarbonate, uses 280-57-9, Triethylenediamine 288-32-4D, Imidazole, derivs. 333-20-0, Potassium thiocyanate 557-09-5, **Zinc** Octoate 917-61-3, Sodium **cyanate** 1330-43-4, Sodium borate 6535-19-9, **Manganese** Octoate 6535-20-2, Iron Octoate 7446-70-0, Aluminum chloride, uses 7637-07-2, Boron trifluoride, uses 7646-85-7, **Zinc** chloride, uses 7705-08-0, Ferric chloride, uses 11130-18-0, Titanium chloride 13395-16-9, **Copper** Acetylacetonate 14024-17-0, Iron Acetylacetonate 14024-18-1, Iron Acetylacetonate 14024-48-7 14024-63-6, **Zinc** Acetylacetonate 14284-89-0, **Manganese** Acetylacetonate 20543-04-8, **Copper** Octoate 21679-46-9, **Cobalt** Acetylacetonate 26444-72-4, Tris(dimethylaminomethyl)pheno 1 55186-09-9, Sodium cyanide dimer 124221-30-3, Disiloxane, 1,3-bis(2-bicyclo[4.2.0]octa-1,3,5-trien-3-ylethenyl)-1,1,3,3-tetramethyl-, homopolymer  
(**catalyst**; encapsulant compn. and **electronic package** utilizing same)
- IT 101-90-6, Resorcinol diglycidyl ether 105-62-4D, Propylene glycol dioleate, derivs. 502-44-3D, .epsilon.-Caprolactone, triol derivs. 2238-07-5, Diglycidyl ether 2425-79-8, 1,4-Butanediol diglycidyl ether 3296-90-0D, Dibromoneopentyl glycol, glycidyl ethers 7487-28-7 9003-17-2D, 1,3-Butadiene homopolymer, **epoxidized** derivs. 9003-49-0D, Poly n-butylacrylate, carboxyl-terminated 9003-55-8, Butadiene styrene copolymer 13236-02-7D, Oxirane, 2,2',2''-[1,2,3-propanetriyltris(oxymethylene)]tris-, propoxylated derivs. 13406-99-0, Oxiranecarboxylic acid, oxiranylmethyl ester 17557-23-2, Neopentylglycol diglycidyl ether 21129-09-9D, 1,2-Tetradecanediol, derivs. 25322-69-4D, Polypropylene glycol, glycidyl ethers 36366-26-4, Trimethylol ethane triglycidyl ether 67938-13-0, Cyclohexane dimethanol diglycidyl ether  
(**electronic packaging** material flexibilizing agent; encapsulant compn. and **electronic package** utilizing same)
- IT 25038-78-2, 4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-,

homopolymer

(**epoxy** resin, catalyst; encapsulant compn. and **electronic package** utilizing same)

IT 409-21-2, Silicon carbide (SiC), uses 1304-56-9, Beryllium oxide, uses 1344-28-1, Aluminum oxide, uses 7631-86-9, Silica, uses 10043-11-5, Boron nitride, uses 12033-89-5, Silicon nitride, uses 24304-00-5, Aluminum nitride 39290-95-4, Zirconium tungstate (filler; encapsulant compn. and **electronic package** utilizing same)

IT 9010-98-4:  
(neoprene rubber, **electronic packaging** material flexibilizing agent; encapsulant compn. and **electronic package** utilizing same)

IT 7782-40-3, Diamond, uses  
(powder, filler; encapsulant compn. and **electronic package** utilizing same)

L88 ANSWER 5 OF 26 HCAPLUS COPYRIGHT 2003 ACS

2002:407305 Document No. 137:7142 Die bonding materials and semiconductor devices. Masuko, Takashi; Aichi, Katsuhide (Hitachi Chemical Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002158239 A2 20020531, 14 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-353571 20001120.

AB Die bonding films have modulus of elasticity <0.1 MPa at >250.degree. before adhesion and 0.5-20 MPa at 250.degree. after thermal curing. Thus, a varnish contained 2,2-bis(4-(4-aminophenoxy)phenyl)propane-1,4-bis(3-aminopropoxy)butane-1,10-decamethylene bis(trimellitate dianhydride) copolymer 100, EXCN 195 20, H 1 (a phenol novolak) 17.5, 2MA-OK (an accelerator) 0.2, A 187 5, and alumina 50 parts.

IT 429677-22-5P  
(die bonding materials and semiconductor devices)

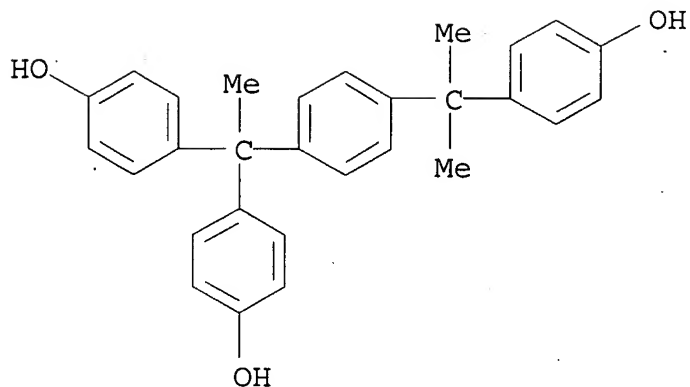
RN 429677-22-5 HCAPLUS

CN Phenol, 4,4'-[1-[4-[1-(4-hydroxyphenyl)-1-methylethyl]phenyl]ethylidene]bis-, polymer with N,N'-(methylenedi-4,1-phenylene)bis[N-(oxiranylmethyl)oxiranemethanamine] (9CI) (CA INDEX NAME)

CM 1

CRN 110726-28-8

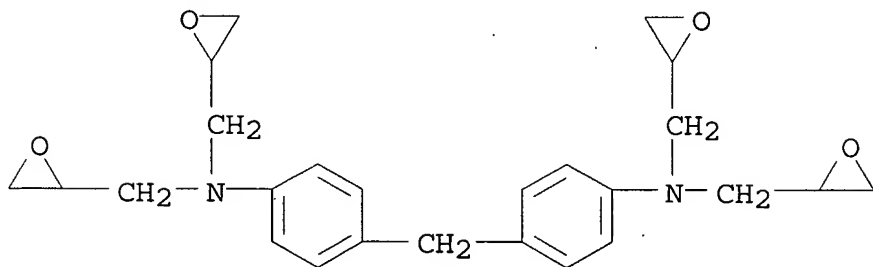
CMF C29 H28 O3



CM 2

CRN 28768-32-3

CMF C25 H30 N2 O4



IT 433292-19-4P

(die bonding materials and semiconductor devices)

RN 433292-19-4 HCAPLUS

CN Phenol, polymer with 1,4-bis(methoxymethyl)benzene and  
 .alpha.,.alpha.'-[(1-methylethylidene)di-4,1-phenylene]bis[.omega.-  
 (oxiranylmethoxy)poly(oxy-1,2-ethanediyl)] (9CI) (CA INDEX NAME)

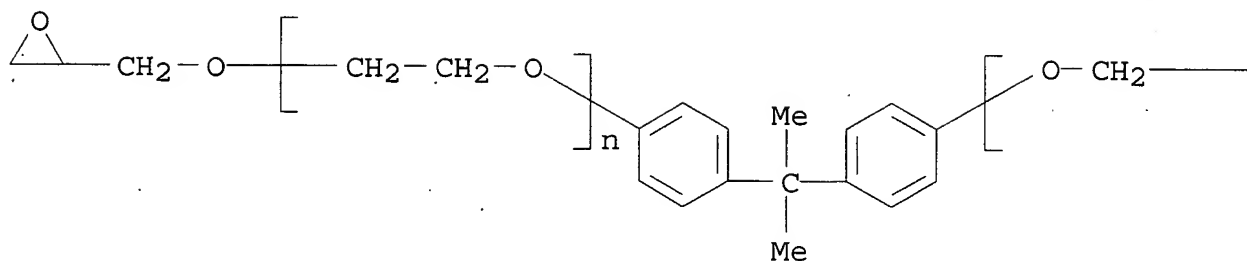
CM 1

CRN 54140-64-6

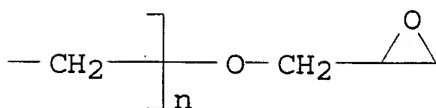
CMF (C2 H4 O)n (C2 H4 O)n C21 H24 O4

CCI PMS

PAGE 1-A



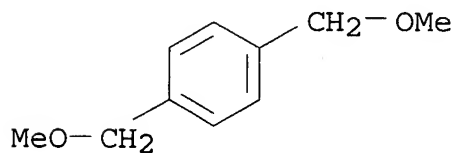
PAGE 1-B



CM 2

CRN 6770-38-3

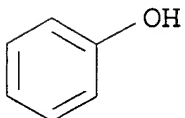
CMF C10 H14 O2



CM 3

CRN 108-95-2

CMF C6 H6 O



IT 36496-82-9 38547-25-0 210980-97-5  
 210980-98-6 219592-97-9, 2,2-Bis(4-(4-aminophenoxy)phenyl)propane-1,4-bis(3-aminopropoxy)butane-1,10-decamethylene bis(trimellitate dianhydride) copolymer



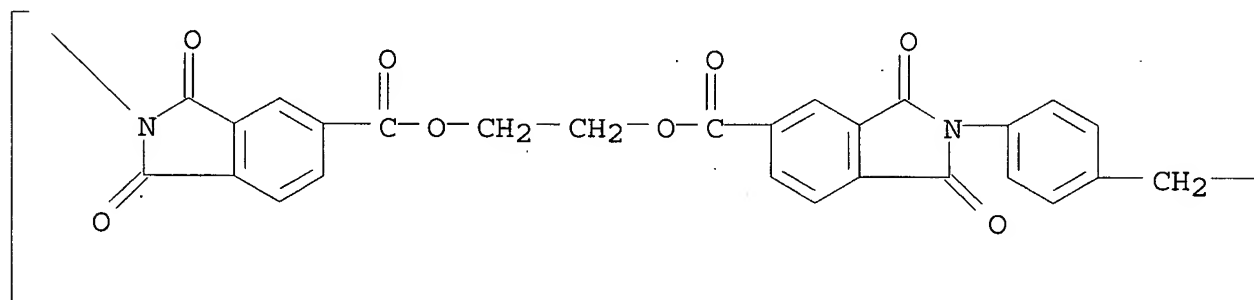
432551-72-9

(die bonding materials and semiconductor devices)

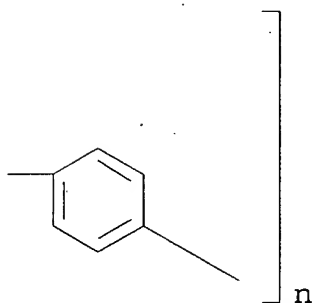
RN 36496-82-9 HCAPLUS

CN Poly[(1,3-dihydro-1,3-dioxo-2H-isoindole-2,5-diyl)carbonyloxy-1,2-ethanediylloxycarbonyl(1,3-dihydro-1,3-dioxo-2H-isoindole-5,2-diyl)-1,4-phenylenemethylene-1,4-phenylene] (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B



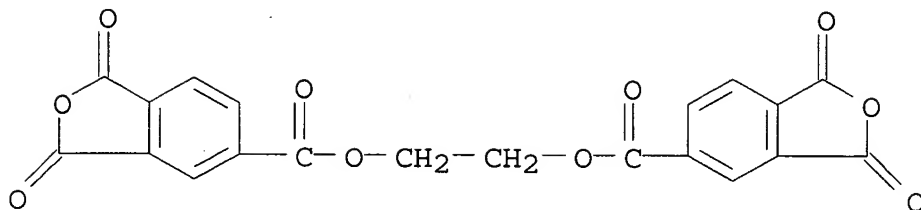
RN 38547-25-0 HCAPLUS

CN 5-Isobenzofurancarboxylic acid, 1,3-dihydro-1,3-dioxo-,  
1,2-ethanediyl ester, polymer with 4,4'-methylenebis[benzenamine]  
(9CI) (CA INDEX NAME)

CM 1

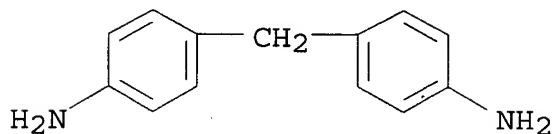
CRN 1732-96-3

CMF C20 H10 O10



CM 2

CRN 101-77-9  
CMF C13 H14 N2

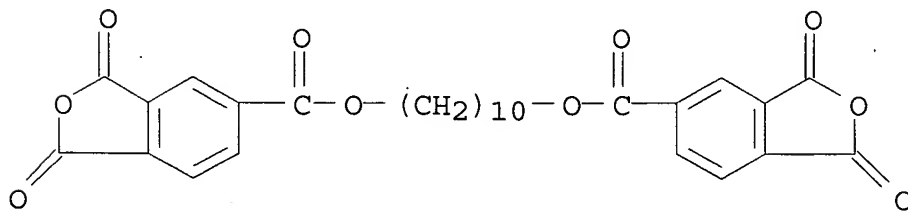


RN 210980-97-5 HCAPLUS

CN 5-Isobenzofurancarboxylic acid, 1,3-dihydro-1,3-dioxo-,  
1,10-decanediyl ester, polymer with 4,4'-[(1-  
methylethylidene)bis(4,1-phenyleneoxy)]bis[benzenamine] (9CI) (CA  
INDEX NAME)

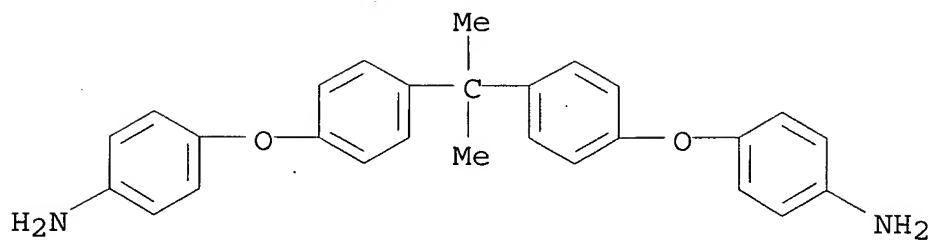
CM 1

CRN 123046-43-5  
CMF C28 H26 O10



CM 2

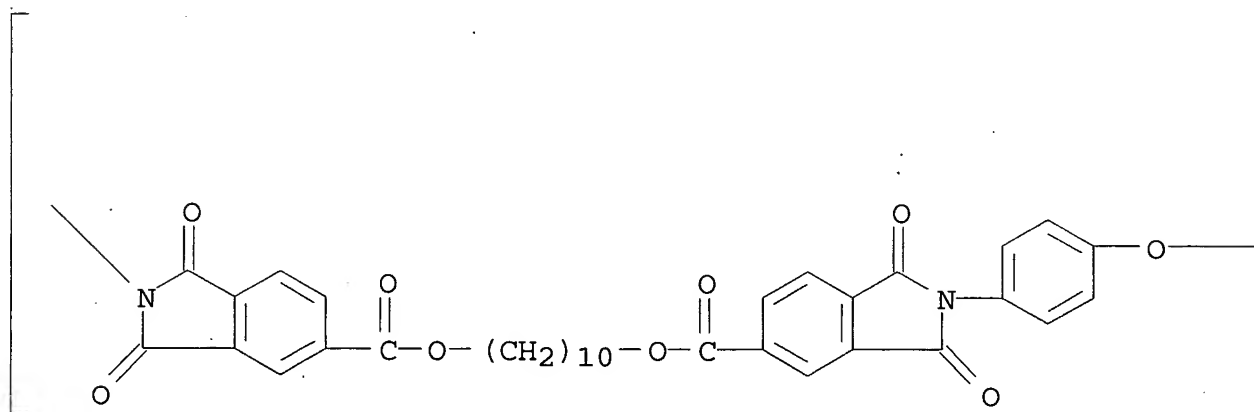
CRN 13080-86-9  
CMF C27 H26 N2 O2



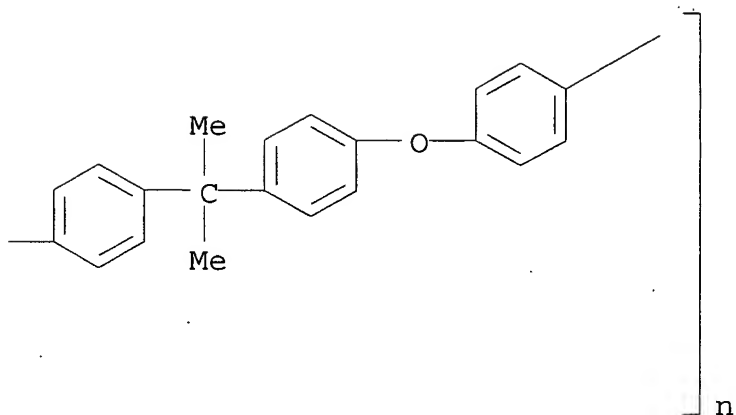
RN 210980-98-6 HCAPLUS

CN Poly[(1,3-dihydro-1,3-dioxo-2H-isoindole-2,5-diyl)carbonyloxy-1,10-decanediylloxycarbonyl(1,3-dihydro-1,3-dioxo-2H-isoindole-5,2-diyl)-1,4-phenyleneoxy-1,4-phenylene(1-methylethylidene)-1,4-phenyleneoxy-1,4-phenylene] (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B



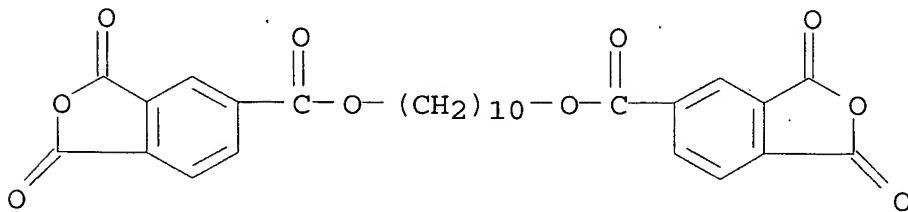
RN 219592-97-9 HCAPLUS

CN 5-Isobenzofurancarboxylic acid, 1,3-dihydro-1,3-dioxo-,  
 1,10-decanediyl ester, polymer with 3,3'-[1,4-  
 butanediylbis(oxy)]bis[1-propanamine] and 4,4'-[(1-  
 methylethylidene)bis(4,1-phenyleneoxy)]bis[benzenamine] (9CI) (CA  
 INDEX NAME)

CM 1

CRN 123046-43-5

CMF C28 H26 O10

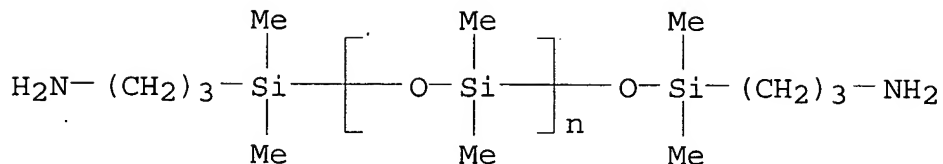


CM 2

CRN 13080-86-9

CMF C27 H26 N2 O2

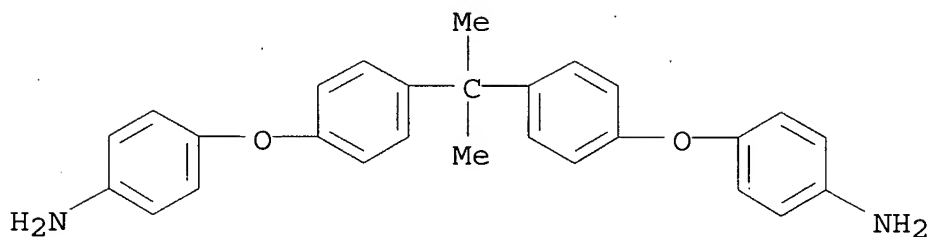




CM 3

CRN 13080-86-9

CMF C27 H26 N2 O2



- IC ICM H01L021-52  
ICS C08G073-10; C09J007-00; C09J171-10; C09J179-08
- CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 76
- ST die bonding **polyimide epoxy** novolak resin  
semiconductor
- IT Coupling agents  
**Electronic packaging** materials  
Fillers  
Glass transition temperature  
Potting compositions  
Semiconductor devices  
Young's modulus  
(die bonding materials and semiconductor devices)
- IT Phenoxy resins  
**Polycyanurates**  
**Polyimides**, uses  
(die bonding materials and semiconductor devices)
- IT Phenolic resins, uses  
(novolak, reaction products with **epoxy** resins; die bonding materials and semiconductor devices)
- IT Polysiloxanes, uses  
(**polyimide**-; die bonding materials and semiconductor devices)
- IT **Polyimides**, uses  
(polysiloxane-; die bonding materials and semiconductor devices)
- IT 429677-22-5P  
(die bonding materials and semiconductor devices)

IT 1319-77-3DP, Cresol, novolak **epoxy** resins, reaction products with phenol novolaks 2300-15-4DP, Trisphenol, novolak resins, reaction products with **epoxy** resins 32492-61-8DP, **epoxy** resins, reaction products with novolak resins **433292-19-4P**

(die bonding materials and semiconductor devices)

IT 1333-16-0D, Bisphenol F, **cyanate** resins **36496-82-9**  
**38547-25-0** **210980-97-5** **210980-98-6**  
**219592-97-9**, 2,2-Bis(4-(4-aminophenoxy)phenyl)propane-1,4-bis(3-aminopropoxy)butane-1,10-decamethylene bis(trimellitate dianhydride) copolymer **432551-72-9**

(die bonding materials and semiconductor devices)

L88 ANSWER 6 OF 26 HCAPLUS COPYRIGHT 2003 ACS

2002:256385 Document No. 136:295816 Low temperature bonding adhesive composition and making adhesive tapes. Rosenfeld, Jerrold C.; Neff, Jerrine L. (Durez Corporation, USA). PCT Int. Appl. WO 2002026888 A2 20020404, 30 pp. DESIGNATED STATES: W: CN, JP, KR; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2001-US42025 20010906. PRIORITY: US 2000-675469 20000928.

AB The compn. is a soln. in an org. solvent of a **polyimide**, an **epoxy** resin, and a **cyanate**. The **polyimide** can be a **polyimide-siloxane**, made from a dianhydride, an arom. diamine that does not contain siloxane, and a siloxanediamine. The adhesive compn. can be used to make a single layer tape, a coated tape, or a double-sided trilayer tape. The tape can bond an article, such as a chip, to a substrate, such as a **circuit board**. An effective bonding compn. contained Epon 1001F 50, AroCy L 10 16.7, and soln. of **polyimide-siloxane**.

IT **158091-28-2P** **406933-94-6P** **406933-95-7P**  
(low temp. bonding adhesive soln. contg. **polyimide**  
-siloxanes, **epoxy** resin, and **cyanate**)

RN 158091-28-2 HCAPLUS

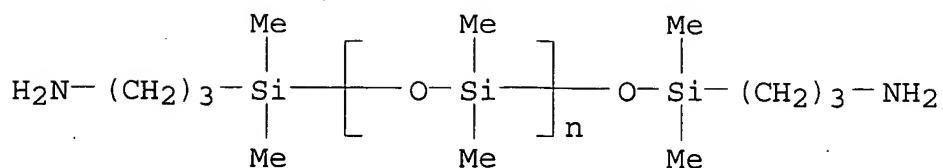
CN 1,3-Isobenzofurandione, 5,5'-oxybis-, polymer with .alpha.-[(3-aminopropyl)dimethylsilyl]-.omega.-[[ (3-aminopropyl)dimethylsilyl]oxy]poly[oxy(dimethylsilylene)] and 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine], block (9CI) (CA INDEX NAME)

CM 1

CRN 97917-34-5

CMF (C2 H6 O Si)n C10 H28 N2 O Si2

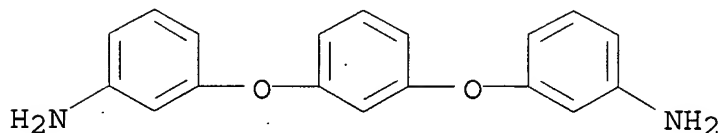
CCI PMS



CM 2

CRN 10526-07-5

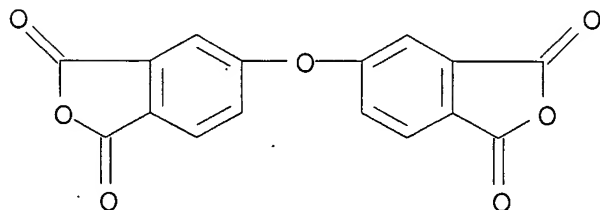
CMF C18 H16 N2 O2



CM 3

CRN 1823-59-2

CMF C16 H6 O7



RN 406933-94-6 HCAPLUS

CN [5,5'-Biisobenzofuran]-1,1',3,3'-tetrone, polymer with .alpha.-[(3-aminopropyl)dimethylsilyl]-.omega.-[[ (3-aminopropyl)dimethylsilyl]oxy]poly[oxy(dimethylsilylene)] and 4-methyl-1,3-benzenediamine (9CI) (CA INDEX NAME)

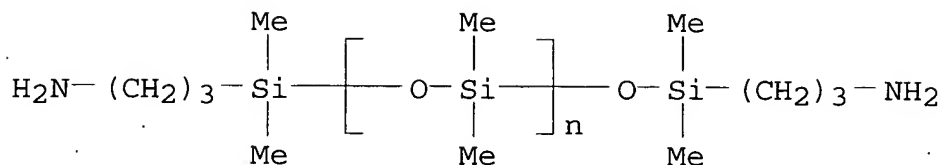
CM 1

CRN 97917-34-5

CMF (C2 H6 O Si)<sub>n</sub> C10 H28 N2 O Si2

CCI PMS

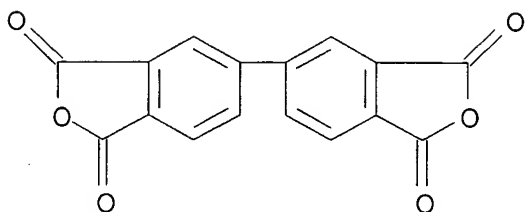




CM 2

CRN 2420-87-3

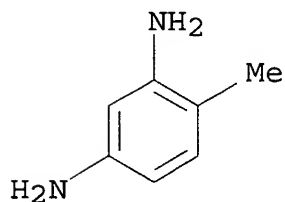
CMF C16 H6 O6



CM 3

CRN 95-80-7

CMF C7 H10 N2



RN 406933-95-7 HCAPLUS

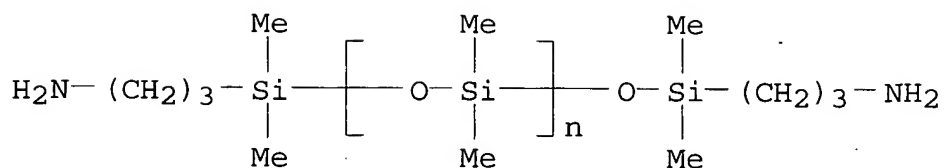
CN 1,3-Isobenzofurandione, 5,5'-(1-methylethylidene)bis-, polymer with .alpha.-[(3-aminopropyl)dimethylsilyl]-.omega.-[[[(3-aminopropyl)dimethylsilyl]oxy]poly[oxy(dimethylsilylene)]] and 4,4'-[1,3-phenylenebis(oxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 97917-34-5

CMF (C2 H6 O Si)n C10 H28 N2 O Si2

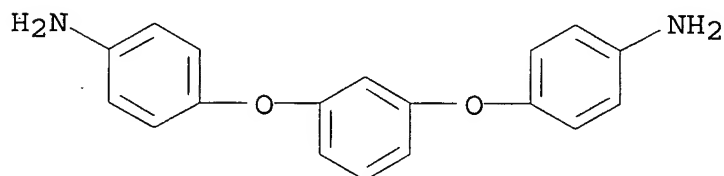
CCI PMS



CM 2

CRN 2479-46-1

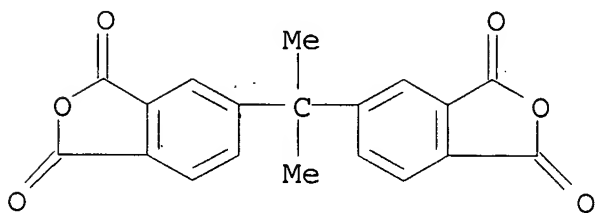
CMF C18 H16 N2 O2



CM 3

CRN 1779-17-5

CMF C19 H12 O6



IT 25068-38-6, Epon 836  
(low temp. bonding adhesive soln. contg. **polyimide**  
-siloxanes, **epoxy** resin, and **cyanate**)

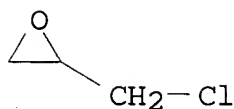
RN 25068-38-6 HCAPLUS

CN Phenol, 4,4'-(1-methylethylidene)bis-, polymer with  
(chloromethyl)oxirane (9CI) (CA INDEX NAME)

CM 1

CRN 106-89-8

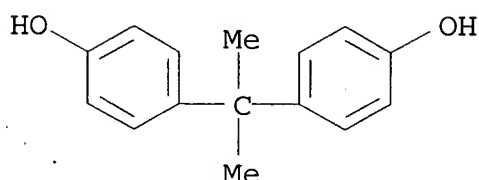
CMF C3 H5 Cl O



CM 2

CRN 80-05-7

CMF C15 H16 O2



- IC ICM C08L079-08  
 ICS C08L063-00; C08K005-29; C09J179-08; C09J163-00; C08L063-02;  
 C09J163-02; C09D179-08; C09D163-00; C08L079-08; C08L063-00;  
 C08L063-00; C08L079-08; C09J179-08; C09J063-00; C09J163-00;  
 C09J079-08
- CC 38-3 (Plastics Fabrication and Uses)
- ST **polyimide** siloxane soln low temp bonding adhesive; heat  
 resistant adhesive **polyimide**
- IT Adhesive tapes  
 (from low temp. bonding adhesive soln. contg. **polyimide**  
 -siloxanes, **epoxy** resin, and **cyanate**)
- IT **Epoxy** resins, uses  
 (low temp. bonding adhesive soln. contg. **polyimide**  
 -siloxanes, **epoxy** resin, and **cyanate**)
- IT Polysiloxanes, uses  
 (**polyimide**-; low temp. bonding adhesive soln. contg.  
**epoxy** resin, **cyanate** and)
- IT **Polyimides**, uses  
 (polysiloxane-; low temp. bonding adhesive soln. contg.  
**epoxy** resin, **cyanate** and)
- IT 158091-28-2P 406933-94-6P 406933-95-7P  
 (low temp. bonding adhesive soln. contg. **polyimide**  
 -siloxanes, **epoxy** resin, and **cyanate**)
- IT 25068-38-6, Epon 836 47073-92-7, AroCy L 10 109489-28-3,  
 Araldite gy 2600 177403-04-2, Epon su-8  
 (low temp. bonding adhesive soln. contg. **polyimide**  
 -siloxanes, **epoxy** resin, and **cyanate**)

Yong-joon (USA). U.S. US 6335571 B1 20020101, 21 pp., Cont.-in-part of U.S. 6,297,560. (English). CODEN: USXXAM. APPLICATION: US 2000-517839 20000302. PRIORITY: US 1997-897968 19970721; US 1997-PV53407 19970721; US 1997-PV56043 19970902; US 1997-926159 19970909; US 1998-12382 19980123; US 1998-120172 19980721; US 1998-137971 19980821.

AB A flip-chip device and process for fabricating the device employs a multilayer encapsulant that includes a 1st portion encapsulant having a coeff. of thermal expansion of .ltoreq.30 ppm/.degree. and an elastic modulus of 2-20 GPa and a 2nd portion comprising a polymer flux having a coeff. of thermal expansion that may exceed 30 ppm/.degree..

IT 25068-38-6, Bisphenol A **epoxy** resin  
384341-16-6

(encapsulant prep.; semiconductor flip-chip package)

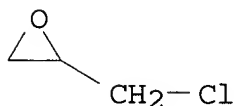
RN 25068-38-6 HCAPLUS

CN Phenol, 4,4'-(1-methylethylidene)bis-, polymer with  
(chloromethyl)oxirane (9CI) (CA INDEX NAME)

CM 1

CRN 106-89-8

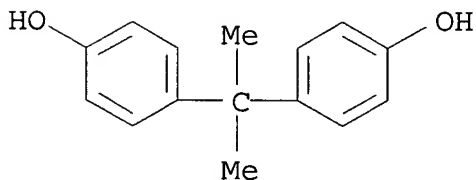
CMF C3 H5 Cl O



CM 2

CRN 80-05-7

CMF C15 H16 O2

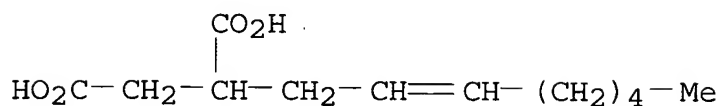


RN 384341-16-6 HCAPLUS

CN Phenol, 4,4'-(1-methylethylidene)bis-, polymer with  
(chloromethyl)oxirane, bis(hydrogen 2-octenylbutanedioate) (9CI)  
(CA INDEX NAME)

CM 1

CRN 62568-82-5  
CMF C12 H20 O4

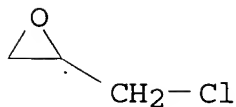


CM 2

CRN 25068-38-6  
CMF (C15 H16 O2 . C3 H5 Cl O) x  
CCI PMS

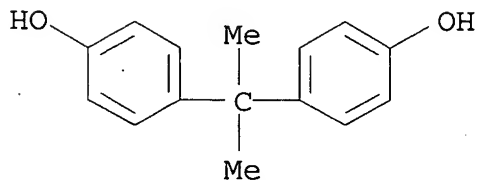
CM 3

CRN 106-89-8  
CMF C3 H5 Cl O



CM 4

CRN 80-05-7  
CMF C15 H16 O2



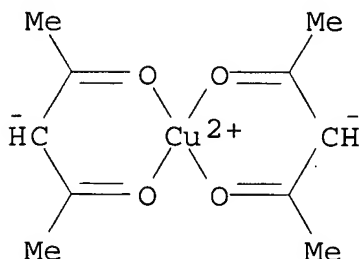
IT 63957-64-2, DEN 438  
(encapsulant resin prep., epoxy resin; semiconductor  
flip-chip package)  
RN 63957-64-2 HCAPLUS  
CN DEN 438 (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

IT 13395-16-9, Copper acetyl acetonate

(encapsulant resin prep.; semiconductor flip-chip package)

RN 13395-16-9 HCAPLUS

CN Copper, bis(2,4-pentanedionato- $\cdot\kappa\text{O},\cdot\kappa\text{O}'$ )-, (SP-4-1)- (9CI)  
(CA INDEX NAME)

IC ICM H01L023-28

ICS H01L023-29

NCL 257787000

CC 76-3 (Electric Phenomena)  
Section cross-reference(s): 38.IT **Polyimides**, uses  
(Upilex; semiconductor flip-chip package)IT **Polyimides**, uses  
(bismaleimide-based, encapsulant resin prep.; semiconductor flip-chip package)IT **Electronic packages**

Encapsulants

Lamination

(semiconductor flip-chip package)

IT 6178-32-1, Glycidyl-4-nonylphenyl ether 25068-38-6,  
Bisphenol A **epoxy** resin 384341-16-6  
(encapsulant prep.; semiconductor flip-chip package)IT 63957-64-2, DEN 438  
(encapsulant resin prep., **epoxy** resin; semiconductor flip-chip package)IT 13395-16-9, Copper acetyl acetonate  
(encapsulant resin prep.; semiconductor flip-chip package)IT 661-20-1, **Cyanate**  
(ester resin, encapsulant resin prep.; semiconductor flip-chip package)

L88 ANSWER 8 OF 26 HCAPLUS COPYRIGHT 2003 ACS

2001:534493 Document No. 135:123549 Thermosetting **polyimide**  
compositions with low dielectric constant. Yamada, Toshiaki; Ban,  
Hajime; Ikeda, Kyo (Mitsubishi Gas Chemical Co., Ltd., Japan). Jpn.  
Kokai Tokkyo Koho JP 2001200157 A2 20010724, 6 pp. (Japanese).  
CODEN: JKXXAF. APPLICATION: JP 2000-6656 20000114.AB The compns., useful as laminates for **printed circuit boards**, etc., contain (a) 100 parts polyfunctional **cyanate** esters or their prepolymers, (b) 0.1-1000 parts **polyimides** with imide ring content 95-100

mol%, and (c) 0.005-5 parts thermosetting catalysts. Thus, a prepreg contg. a glass cloth impregnated with a compn. contg. 2,2-bis(4-cyanatophenyl)propane prepolymer 20, IPDI-pyromellitic dianhydride copolymer 20, ESCN 220F (cresol novolak **epoxy** resin) 60, and Zn octylate 0.004 part was sandwiched between Cu foils and cured to give a Cu-clad laminate showing dielec. const. 3.2, Tg 235.degree., and good solder heat resistance.

IT 25722-66-1P, 2,2-Bis(4-cyanatophenyl)propane polymer  
 34778-96-6P, 1,4-Dicyanatobenzene polymer  
 169458-34-8P, IPDI-pyromellitic dianhydride copolymer  
 169597-70-0P, benzophenonetetracarboxylic dianhydride-IPDI copolymer  
 (thermosetting **polyimide** compns. with low dielec. const.)

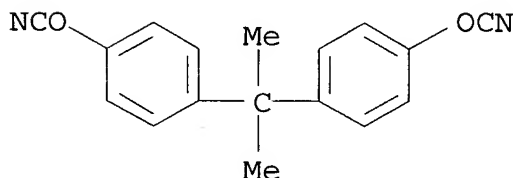
RN 25722-66-1 HCAPLUS

CN Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1156-51-0

CMF C17 H14 N2 O2



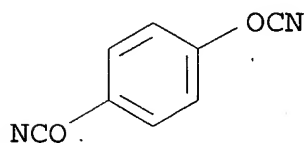
RN 34778-96-6 HCAPLUS

CN Cyanic acid, 1,4-phenylene ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1129-80-2

CMF C8 H4 N2 O2



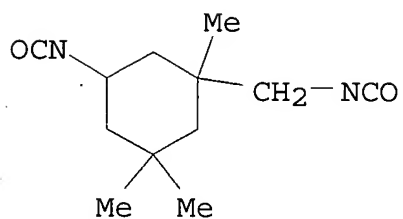
RN 169458-34-8 HCAPLUS

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with 5-isocyanato-1-(isocyanatomethyl)-1,3,3-trimethylcyclohexane (9CI) (CA INDEX NAME)

CM 1

CRN 4098-71-9

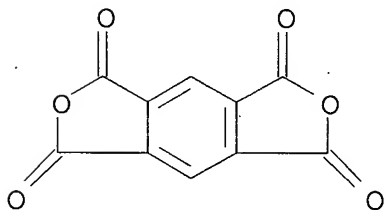
CMF C12 H18 N2 O2



CM 2

CRN 89-32-7

CMF C10 H2 O6



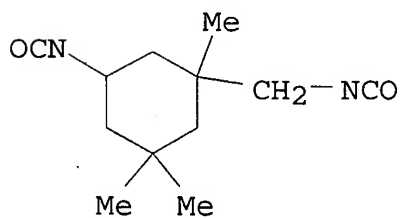
RN 169597-70-0 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with  
5-isocyanato-1-(isocyanatomethyl)-1,3,3-trimethylcyclohexane (9CI)  
(CA INDEX NAME)

CM 1

CRN 4098-71-9

CMF C12 H18 N2 O2

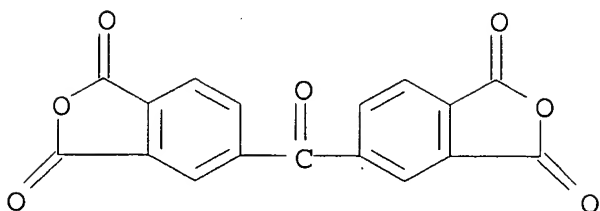




CM 2

CRN 2421-28-5

CMF C17 H6 O7



- IC ICM C08L079-08  
ICS C08K005-29; C08K005-3477; C08L079-06; H05K001-03
- CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 76
- ST thermosetting **polyimide** dielec laminate copper clad;  
cyanatophenylpropane IPDI pyromellitic anhydride **polyimide epoxy**
- IT **Epoxy** resins, uses  
(phenolic, novolak; thermosetting **polyimide** compns. with low dielec. const.)
- IT Reinforced plastics  
(prepregs; thermosetting **polyimide** compns. with low dielec. const.)
- IT **Printed circuit boards**  
(thermosetting **polyimide** compns. with low dielec. const.)
- IT **Polyimides**, uses  
(thermosetting **polyimide** compns. with low dielec. const.)
- IT Laminated plastics, uses  
(thermosetting **polyimide** compns. with low dielec. const.)
- IT 25722-66-1P, 2,2-Bis(4-cyanatophenyl)propane polymer  
34778-96-6P, 1,4-Dicyanatobenzene polymer  
169458-34-8P, IPDI-pyromellitic dianhydride copolymer  
169597-70-0P, benzophenonetetracarboxylic dianhydride-IPDI copolymer  
(thermosetting **polyimide** compns. with low dielec. const.)
- IT 84593-73-7, ESCN 220F  
(thermosetting **polyimide** compns. with low dielec. const.)

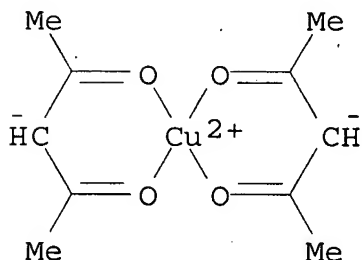
**packaging** with good flow and gap fill properties. Hayase, Rumiko; Fujieda, Yoshinobu; Murai, Shinji; Hotta, Yasuyuki (Toshiba Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2000344886 A2 20001212, 15 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-160947 19990608.

AB The compns. giving packages with good impact and moisture resistance contain (A) **cyanate** compds., (B) resorcinol diglycidyl ether resins, (C) organometal compds., and (D) inorg. fillers. Thus, a compn. contg. a bisphenol A **dicyanate** 5.6, resorcinol diglycidyl ether 3.2, Cu Acac compd. 0.2, fused silica 85, o-cresol novolak **epoxy** resin 2.8, carnauba wax 0.5, a pigment 0.4, a coupler 0.3 and a fireproofing aid 2.0 parts showed 175.degree.-melt viscosity 23 and 61 Pa.cntdot.s initially and after 1 wk at 30.degree., and gave cured test pieces with flexural modulus 19 GPa, flexural strength 164 MPa, heat expansion 16x108/K, glass temp. 145.degree., adhesion strength 18 MPa and water absorption 4500 ppm.

IT 13395-16-9, Copper acetylacetonate  
(cationic curing catalyst; thermosetting resin compns. contg. **cyanate** compds. for use in **electronic packaging** with good flow and gap fill properties)

RN 13395-16-9 HCAPLUS

CN Copper, bis(2,4-pentanedionato-.kappa.O,.kappa.O')-, (SP-4-1) - (9CI)  
(CA INDEX NAME)



IT 25068-38-6D, Bisphenol A **epoxy** resin, glycidyl ethers  
(thermosetting resin compns. contg. **cyanate** compds. for use in **electronic packaging** with good flow and gap fill properties)

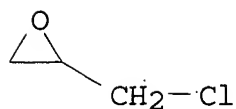
RN 25068-38-6 HCAPLUS

CN Phenol, 4,4'-(1-methylethylidene)bis-, polymer with (chloromethyl)oxirane (9CI) (CA INDEX NAME)

CM 1

CRN 106-89-8

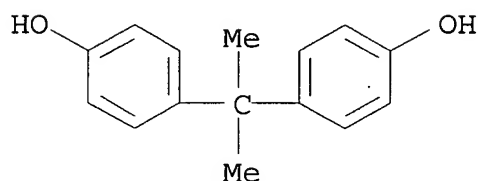
CMF C3 H5 Cl O



CM 2

CRN 80-05-7

CMF C15 H16 O2

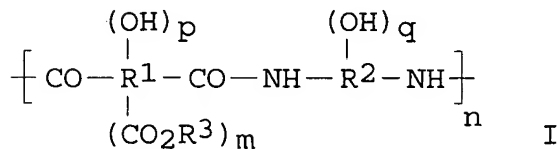


- IC ICM C08G073-06  
ICS H01L023-29; H01L023-31
- CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 76
- ST moisture resistance **electronic packaging epoxy resin**; bisphenol **cyanate ester epoxy resin electronic packaging**; resorcinol diglycidyl ether **electronic packaging epoxy resin**; gap fill property **epoxy resin electronic packaging**; flow property **epoxy resin electronic packaging**; semiconductor device fabrication **epoxy resin**
- IT **Epoxy resins, uses**  
([biphenyl]diol-based; thermosetting resin compns. contg. **cyanate compds. for use in electronic packaging with good flow and gap fill properties**)
- IT Phenolic resins, uses  
(**epoxy**; thermosetting resin compns. contg. **cyanate compds. for use in electronic packaging with good flow and gap fill properties**)
- IT **Epoxy resins, uses**  
(phenolic; thermosetting resin compns. contg. **cyanate compds. for use in electronic packaging with good flow and gap fill properties**)
- IT **Electronic packaging materials**  
Impact-resistant materials  
Water-resistant materials  
(thermosetting resin compns. contg. **cyanate compds. for use in electronic packaging with good flow and gap fill properties**)

- IT **Epoxy** resins, uses  
(thermosetting resin compns. contg. **cyanate** compds. for use in **electronic packaging** with good flow and gap fill properties)
- IT 13395-16-9, Copper acetylacetonate 15306-17-9  
288629-48-1 288629-56-1 312636-59-2  
(cationic curing catalyst; thermosetting resin compns. contg. **cyanate** compds. for use in **electronic packaging** with good flow and gap fill properties)
- IT 1156-51-0, Bisphenol A **dicyanate** 47073-92-7  
127667-44-1 133685-37-7 204381-15-7  
(crosslinking agent; thermosetting resin compns. contg. **cyanate** compds. for use in **electronic packaging** with good flow and gap fill properties)
- IT 101-90-6, Resorcinol diglycidyl ether  
(thermosetting resin compns. contg. **cyanate** compds. for use in **electronic packaging** with good flow and gap fill properties)
- IT 9003-17-2D, Polybutadiene, **epoxidized** 25053-96-7D,  
o-Cresol-formaldehyde copolymer, glycidyl ethers 25068-38-6D  
, Bisphenol A **epoxy** resin, glycidyl ethers  
(thermosetting resin compns. contg. **cyanate** compds. for use in **electronic packaging** with good flow and gap fill properties)

L88 ANSWER 10 OF 26 HCAPLUS COPYRIGHT 2003 ACS  
2000:89548 Document No. 132:144416 Alkaline-developable photosensitive heat-resistant polymer precursor composition. Tomikawa, Masao; Yoshida, Naoyo; Okuda, Ryoji (Toray Industries, Inc., Japan). Jpn. Kokai Tokkyo Koho JP 2000039714 A2 20000208, 14 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-128166 19990510. PRIORITY: JP 1998-131765 19980514.

GI



- AB The title compn. comprises (a) polymer comprising a structuring repeating unit of I (R<sup>1</sup> = 2- to 8-valent org. group having .gtoreq.2 carbons; R<sup>2</sup> = 2- to 6-valent org. group contg. .gtoreq.2 carbons; R<sup>3</sup> = H, org. group contg. 1-20 carbons; n = 10-100,000; m = 0, 1, 2; p, q = 0-4; m + p + q .gtoreq.1), (b) quinonediazide compd., and (c) hardening agent. The hardening agent may be epoxy resin or metal (Ti, Al, or Zr) chelate compd.

IT 257280-01-6P 257280-03-8P  
(in alk.-developable photosensitive heat-resistant polymer precursor compn.)

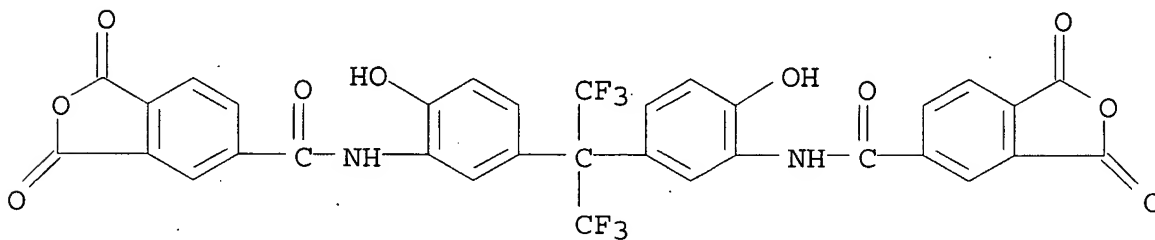
RN 257280-01-6 HCAPLUS

CN 5-Isobenzofurancarboxamide, N,N'-[[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis(6-hydroxy-3,1-phenylene)]bis[1,3-dihydro-1,3-dioxo-, polymer with 3,3'-(1,1,3,3-tetramethyl-1,3-disiloxanediyl)bis[1-propanamine] and N,N'-[[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis(6-hydroxy-3,1-phenylene)]bis[3-aminobenzamide] (9CI) (CA INDEX NAME)

CM 1

CRN 223255-30-9

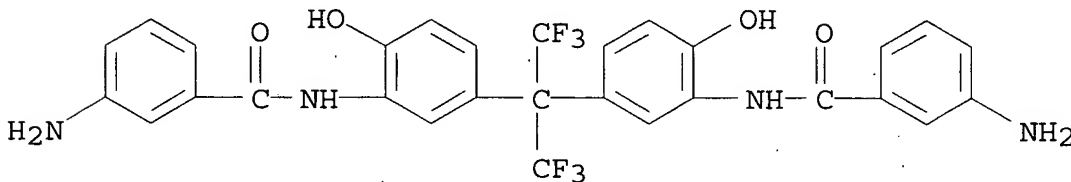
CMF C33 H16 F6 N2 O10



CM 2

CRN 220426-92-6

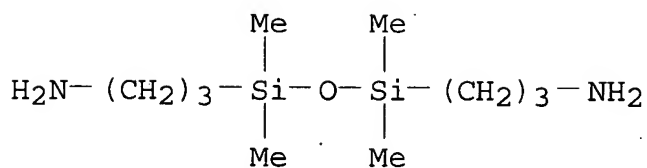
CMF C29 H22 F6 N4 O4



CM 3

CRN 2469-55-8

CMF C10 H28 N2 O Si2



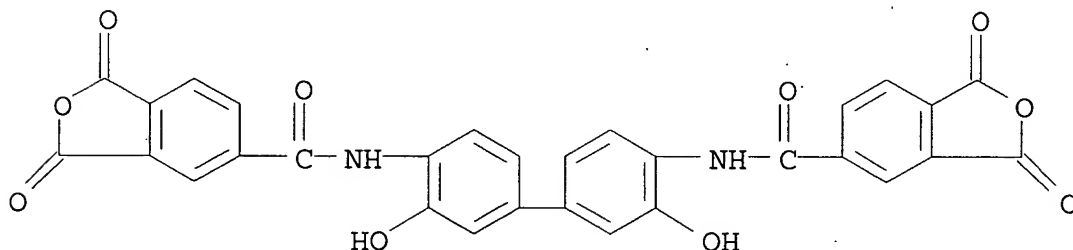
RN 257280-03-8 HCAPLUS

CN 5-Isobenzofurancarboxamide, N,N'-(3,3'-dihydroxy[1,1'-biphenyl]-4,4'-diyl)bis[1,3-dihydro-1,3-dioxo-, polymer with [5,5'-biisobenzofuran]-1,1',3,3'-tetrone, 4,4'-oxybis[benzenamine] and 3,3'-(1,1,3,3-tetramethyl-1,3-disiloxanediyl)bis[1-propanamine] (9CI) (CA INDEX NAME)

CM 1

CRN 22452-77-3

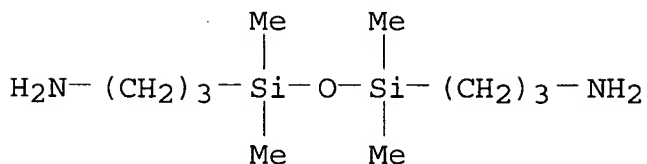
CMF C30 H16 N2 O10



CM 2

CRN 2469-55-8

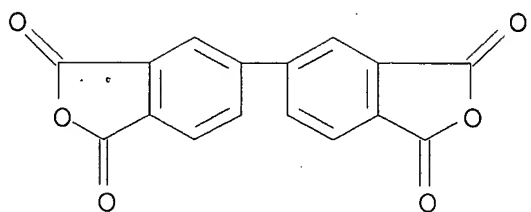
CMF C10 H28 N2 O Si2



CM 3

CRN 2420-87-3

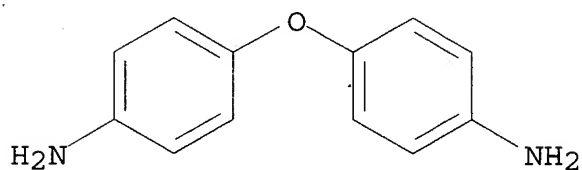
CMF C16 H6 O6



CM 4

CRN 101-80-4

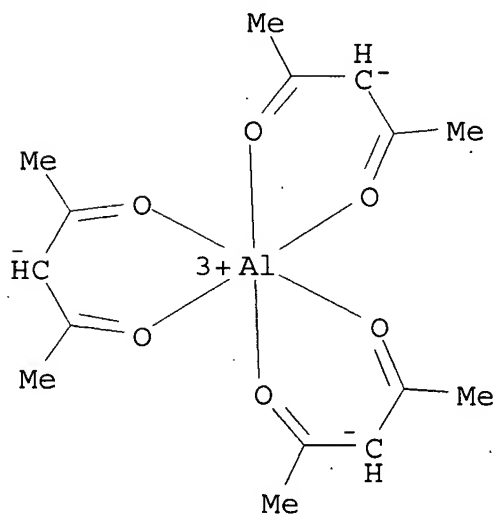
CMF C12 H12 N2 O



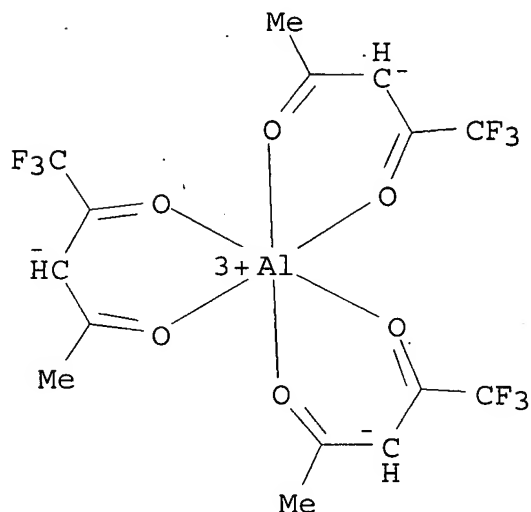
IT 13963-57-0 14354-59-7, Aluminum tris(  
trifluoroacetylacetonate) 14592-89-3, Chromium  
(III) trifluoroacetylacetonate 17501-44-9,  
Zirconium (IV) acetylacetonate 17501-79-0,  
Titanium (IV) acetylacetonate  
(in alk.-developable photosensitive heat-resistant polymer  
precursor compn.)

RN 13963-57-0 HCAPLUS

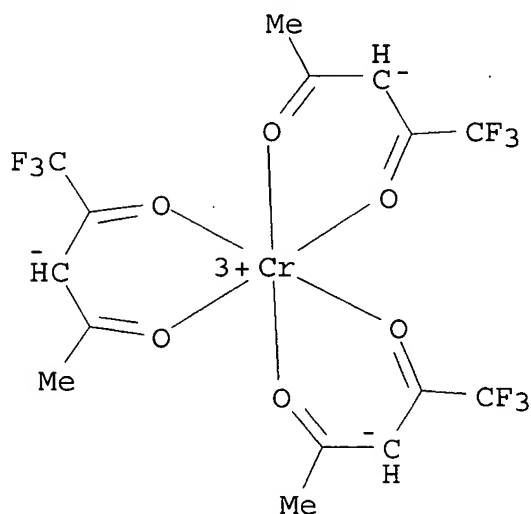
CN Aluminum, tris(2,4-pentanedionato-.kappa.O,.kappa.O')-, (OC-6-11)-  
(9CI) (CA INDEX NAME)



RN 14354-59-7 HCAPLUS

CN Aluminum, tris(1,1,1-trifluoro-2,4-pentanedionato-  
.kappa.O,.kappa.O')- (9CI) (CA INDEX NAME)

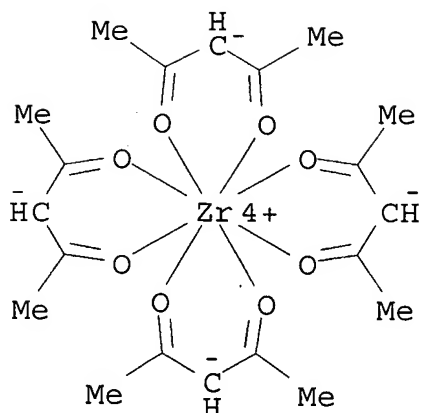
RN 14592-89-3 HCAPLUS

CN Chromium, tris(1,1,1-trifluoro-2,4-pentanedionato-  
.kappa.O,.kappa.O')- (9CI) (CA INDEX NAME)

RN 17501-44-9 HCAPLUS

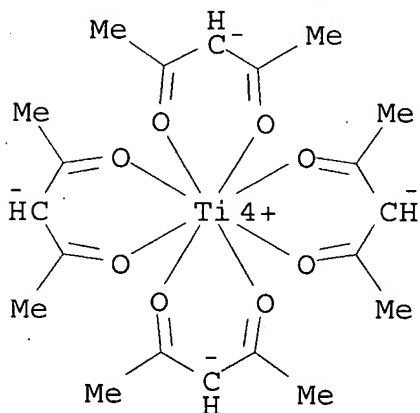
CN Zirconium, tetrakis(2,4-pentanedionato-.kappa.O,.kappa.O')-,  
(SA-8-11''11''1'1''1'1'')- (9CI) (CA INDEX NAME)





RN 17501-79-0 HCAPLUS

CN Titanium, tetrakis(2,4-pentanedionato-.kappa.O, .kappa.O') - (9CI)  
(CA INDEX NAME)



IC ICM G03F007-037

ICS C08K005-28; C09D005-00; G03F007-022; H01L021-027; H01L021-312;  
H01L023-29; H01L023-31; C08L079-08; C09D179-04; C09D179-08;  
C08L063-00

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and  
Other Reprographic Processes)

Section cross-reference(s): 38, 42, 76

IT 25085-92-1P, 4,4'-Diaminodiphenyl ether-benzophenonetetracarboxylic  
dianhydride-pyromellitic anhydride copolymer 223449-04-5P,  
2,2-Bis(3-amino-4-hydroxyphenyl)hexafluoropropane-1,3-bis(3-  
aminopropyl)tetramethyldisiloxane-4,4'-diaminodiphenyl  
ether-trimellitic anhydride copolymer 257280-01-6P  
257280-03-8P 257280-04-9P, 2,2-Bis(3-amino-4-  
hydroxyphenyl)hexafluoropropane-4,4'-dicarboxydiphenyl ether  
chloride-isophthalic acid chloride copolymer  
(in alk.-developable photosensitive heat-resistant polymer  
precursor compn.)

- IT 13963-57-0 14354-59-7, Aluminum tris(  
trifluoroacetylacetonate) 14592-89-3, Chromium  
(III) trifluoroacetylacetonate 17501-44-9,  
Zirconium (IV) acetylacetonate 17501-79-0,  
Titanium (IV) acetylacetonate 25068-38-6, Epikote 828  
257280-02-7  
(in alk.-developable photosensitive heat-resistant polymer  
precursor compn.)
- L88 ANSWER 11 OF 26 HCAPLUS COPYRIGHT 2003 ACS  
1999:699213 Document No. 131:323595 Curable polyphenylene ether and  
thermosetting polymer compositions for **printed-**  
**circuit boards** and their fiber-reinforced  
plastics. Tracy, James Estel; Yeager, Gary William (General  
Electric Co., USA). Jpn. Kokai Tokkyo Koho JP 11302529 A2 19991102  
Heisei, 13 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP  
1998-106817 19980417.
- AB Title compn. having improved processability, and solvent and solder  
resistance, comprises .gtoreq.1 polyphenylene ether having no. av.  
mol. wt. .ltoreq.3000, and .gtoreq.1 other thermosetting polymer.  
Thus, a glass fiber mat was impregnated with a compn. of  
poly(phenylene oxide) (Mn 1256) 28.9, BPO 1.2, bisphenol A 1.2,  
tetrabromobisphenol A diglycidyl ether 38.1, bisphenol A diglycidyl  
ether-tetrabromobisphenol A copolymer 13.3, **epoxidized**  
phenol-formaldehyde novolak 13.3, and **catalyst** (contg.  
**zinc** octanoate, 2-methyl-4-ethylimidazole and  
diaminodiethylbenzene) 4.0 parts, laminated and cured to give a test  
piece showing good MeCl<sub>2</sub> and solder resistance.
- IC ICM C08L071-12  
ICS C08L063-00; C08L101-00; C08G065-48; C08J005-10
- CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 76
- ST polyphenylene ether thermosetting polymer **printed**  
**circuit**; fiber reinforced polyphenylene ether **epoxy**  
laminate; solvent resistance polyphenylene ether **epoxy**  
resin; solder resistance polyphenylene ether **epoxy** resin
- IT **Polyimides**, uses  
(bismaleimide-based; curable polyphenylene ether and  
thermosetting polymer compns. for **printed-**  
**circuit boards**)
- IT **Epoxy** resins, uses  
(bromine-contg.; curable polyphenylene ether and thermosetting  
polymer compns. for **printed-circuit**  
**boards**)
- IT **Printed circuit boards**  
(curable polyphenylene ether and thermosetting polymer compns.  
for **printed-circuit boards**)
- IT Alkyd resins  
**Epoxy** resins, uses  
Phenolic resins, uses  
**Polycyanurates**  
Polyesters, uses

- Polyimides, uses
- Polyurethanes, uses
  - (curable polyphenylene ether and thermosetting polymer compns. for **printed-circuit boards**)
- IT Glass fiber fabrics
  - (curable polyphenylene ether and thermosetting polymer compns. for **printed-circuit boards**)
- IT Laminated plastics, uses
  - (curable polyphenylene ether and thermosetting polymer compns. for **printed-circuit boards**)
- IT Reinforced plastics
  - (fiber-reinforced; curable polyphenylene ether and thermosetting polymer compns. for **printed-circuit boards**)
- IT Solvent-resistant materials
  - Solvent-resistant materials
  - (heat-resistant; curable polyphenylene ether and thermosetting polymer compns. for **printed-circuit boards**)
- IT Polysiloxanes, uses
  - (mineral-filled; curable polyphenylene ether and thermosetting polymer compns. for **printed-circuit boards**)
- IT Polyoxyphenylenes
  - (polymers with bisphenol A; curable polyphenylene ether and thermosetting polymer compns. for **printed-circuit boards**)
- IT Phenolic resins, uses
  - (polymers with **epoxy** resins; curable polyphenylene ether and thermosetting polymer compns. for **printed-circuit boards**)
- IT Vinyl compounds, uses
  - (polymers; curable polyphenylene ether and thermosetting polymer compns. for **printed-circuit boards**)
- IT Polymer blends
  - (polyphenylene ether and **epoxy** resins; curable polyphenylene ether and thermosetting polymer compns. for **printed-circuit boards**)
- IT Heat-resistant materials
  - Heat-resistant materials
  - (solvent-resistant; curable polyphenylene ether and thermosetting polymer compns. for **printed-circuit boards**)
- IT 79-94-7DP, Tetrabromobisphenol A, polymers with **epoxy** resins 80-05-7DP, Bisphenol A, polymers with polyphenylene ether 3072-84-2DP, Tetrabromobisphenol A diglycidyl ether, polymers with **epoxy** resins 9003-35-4DP, Phenol-formaldehyde copolymer, polymers with **epoxy** resins 9016-83-5DP, Cresol-formaldehyde copolymer, **epoxidized**, polymers with **epoxy** resins 139196-38-6P, Benzocyclobutene polymer
  - (curable polyphenylene ether and thermosetting polymer compns. for **printed-circuit boards**)

L88 ANSWER 12 OF 26 HCAPLUS COPYRIGHT 2003 ACS

1999:659442 Document No. 131:287283 Polyimide compositions having cinnamic acid moieties. Okada, Kohji; Nojiri, Hitoshi (Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Japan). PCT Int. Appl. WO 9951662 A1 19991014, 88 pp. DESIGNATED STATES: W: JP, KR, US. (Japanese). CODEN: PIXXD2. APPLICATION: WO 1999-JP1705 19990331. PRIORITY: JP 1998-88681 19980401; JP 1998-138758 19980520; JP 1998-156411 19980604; JP 1998-156426 19980604; JP 1998-156388 19980604; JP 1998-157056 19980605; JP 1998-156990 19980605; JP 1998-171521 19980618; JP 1998-226294 19980810.

AB Title polyimide compns. have cinnamic acid or cinnamic acid deriv. skeletons in the main or side chains and possess both photoreactivity and heat reactivity characteristic to the cinnamic acid skeletons. Thus, 59.44 g 3,5-dinitrobenzyl alc. and 66.64 g cinnamic chloride were reacted to give 85 g 3,5-dinitrobenzyl cinnamate, 65.6 g of which was reduced in the presence of Pt-contg. carbon black to give 53.6 g 3,5-diaminobenzyl cinnamate, 26.8 g of which was polymd. with 57.65 g 2,2-bis(4-hydroxyphenyl)propane dibenzoate-3,3',4,4'-tetracarboxylic dianhydride to give 73 g polyimide with Mw 80,000.

IT 246246-31-1P, 1,3-Diaminopropane-2-ol-6FDA copolymer cinnamate 246246-33-3P, 1,3-Bis(4-aminophenoxy)-2-propanol-6FDA copolymer cinnamate  
(prepn. of polyimide compns. having cinnamic acid moieties)

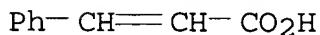
RN 246246-31-1 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis-, polymer with 1,3-diamino-2-propanol, 3-phenyl-2-propenoate (ester) (9CI) (CA INDEX NAME)

CM 1

CRN 621-82-9

CMF C9 H8 O2



CM 2

CRN 246246-30-0

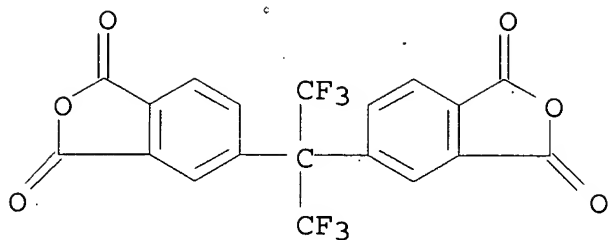
CMF (C19 H6 F6 O6 . C3 H10 N2 O)x

CCI PMS

CM 3

CRN 1107-00-2

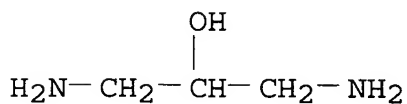
CMF C19 H6 F6 O6



CM 4

CRN 616-29-5

CMF C3 H10 N2 O



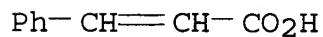
RN 246246-33-3 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis-, polymer with 1,3-bis(4-aminophenoxy)-2-propanol, 3-phenyl-2-propenoate (ester) (9CI) (CA INDEX NAME)

CM 1

CRN 621-82-9

CMF C9 H8 O2



CM 2

CRN 246246-32-2

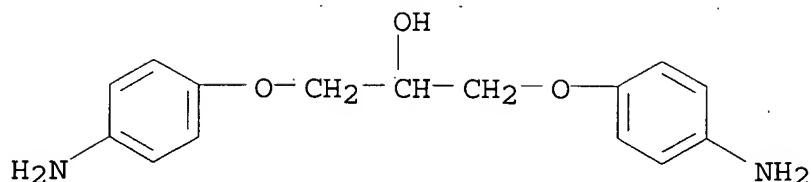
CMF (C19 H6 F6 O6 . C15 H18 N2 O3)x

CCI PMS

CM 3

CRN 25151-48-8

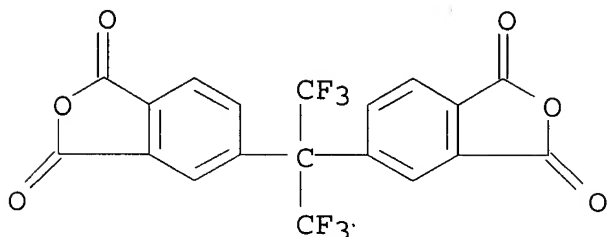
CMF C15 H18 N2 O3



CM 4

CRN 1107-00-2

CMF C19 H6 F6 O6



- IC ICM C08G073-10  
ICS C07C229-44; C07C317-36; C07C323-37; C07D307-89  
CC 37-6 (Plastics Manufacture and Processing)  
IT 7439-89-6, Iron, uses 7440-02-0, Nickel, uses 7440-23-5, Sodium, uses 7440-50-8, **Copper**, uses  
(catalysts in diamine monomer prepn.; prepn. of polyimide compns. having cinnamic acid moieties)  
IT 102-92-1DP, Cinnamic chloride, reaction products with polyimides  
246243-13-0P 246243-14-1P 246243-16-3P 246243-20-9P  
246243-25-4P 246243-27-6P 246243-33-4P 246243-39-0P  
246243-44-7P 246243-47-0P 246243-48-1P 246243-51-6P  
246243-52-7P 246243-55-0P 246243-58-3DP, polymers with dianiline derives. 246243-60-7DP, polymers with dianhydride and dianiline derives. 246243-61-8DP, 1,3-Diaminopropane-2-ol-6FDA copolymer, polyimide sru, reaction products with cinnamic chloride  
246243-64-1P 246243-65-2P 246243-66-3DP, reaction products with cinnamic chloride 246243-67-4DP, polymers with dianhydride and dianiline derives. 246245-77-2P, 2,2-Bis(4-hydroxyphenyl)propane dibenzoate-3,3',4,4'-tetracarboxylic dianhydride-2,4-diaminophenol cinnamate copolymer, polyimide sru 246246-04-8P,  
2-(2,4-Diaminophenoxy)ethyl cinnamate-2,2'-hexafluoropropylidenediphthalic dianhydride copolymer, sru  
246246-31-1P, 1,3-Diaminopropane-2-ol-6FDA copolymer cinnamate 246246-33-3P, 1,3-Bis(4-aminophenoxy)-2-propanol-6FDA copolymer cinnamate  
(prepn. of polyimide compns. having cinnamic acid moieties)

L88 ANSWER 13 OF 26 HCAPLUS COPYRIGHT 2003 ACS

1999:317299 Document No. 131:6066 Epoxy resin compositions having excellent heat and moisture resistance and adhesion to polyimide films. Hirayama, Takao; Nanami, Tadashi; Ito, Toshihiko; Tanaka, Masaru; Ogata, Shoji; Hirokawa, Kozo (Hitachi Chemical Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 11130960 A2 19990518 Heisei, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-300600 19971031.

AB In title compns. comprising modified epoxy resins, rubbers, and curing agents, the epoxy resins are obtained by reaction of acid-terminated polyamides (a) having alkylene ether units and/or carbonate units and carboxy groups at both ends with epoxy resins (b) with (epoxy group in b)/(carboxy group in a) ratio .gtoreq.1. The compns. are useful for adhesives and semiconductor sealing materials as tape carrier package. Thus, polytetramethylene ether glycol sebacic acid diester 37.9, adipic acid 7.9, sebacic acid 10.9, isophthalic acid 18.0, MDI 25.5, and Coronate T 80 (TDI) 17.7 g were polymd. in .gamma.-butyrolactone-N-methylpyrrolidone and reacted with 22.0 g Epikote 828 to give a modified epoxy resins, which (257 g) was mixed with 10 g N 220S (NBR rubber), 10 g Epikote 1001, and 2-ethyl-4-methylimidazole, and cyclohexanone and applied to a plate to give a film showing adhesion strength 1.1 KN/m to bright Cu foil and good soldering and chem. resistance.

IT 225642-63-7DP, polymers with **epoxidized** rubbers and brominated epoxy resins 225642-69-3DP, polymers with **epoxidized** rubbers and brominated epoxy resins (epoxy resin compns. having good heat and moisture resistance and adhesion to polyimide films)

RN 225642-63-7 HCAPLUS

CN 1,2,4-Benzenetricarboxylic acid, polymer with .alpha.-(2-aminomethylethyl)-.omega.-(2-aminomethylethoxy)poly[oxy(methyl-1,2-ethanediyl)], 1,3-benzenedicarboxylic acid, Coronate T 80, decanedioic acid, 1,3-dihydro-1,3-dioxo-5-isobenzofurancarboxylic acid, hexanedioic acid, 1,1'-methylenebis[4-isocyanatobenzene], 4,4'-[(1-methylethylidene)bis(4,1-phenyleneoxy)]bis[benzenamine] and Pratherm EP 16 (9CI) (CA INDEX NAME)

CM 1

CRN 138789-90-9

CMF Unspecified

CCI MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 2

CRN 91825-07-9

CMF Unspecified

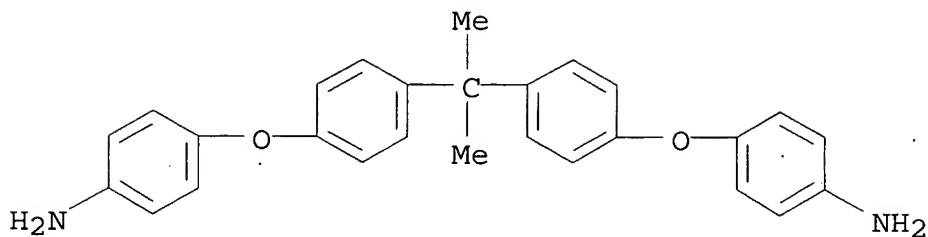
CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 3

CRN 13080-86-9

CMF C27 H26 N2 O2

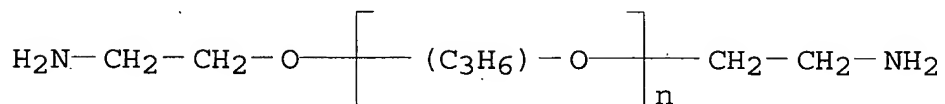


CM 4

CRN 9046-10-0

CMF (C3 H6 O)<sub>n</sub> C6 H16 N2 O

CCI IDS, PMS

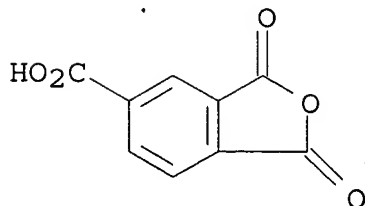


2 ( D1-Me )

CM 5

CRN 552-30-7

CMF C9 H4 O5

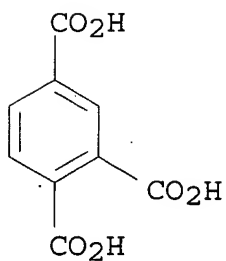




CM 6

CRN 528-44-9

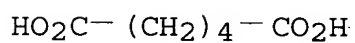
CMF C9 H6 O6



CM 7

CRN 124-04-9

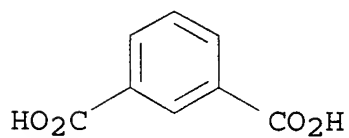
CMF C6 H10 O4



CM 8

CRN 121-91-5

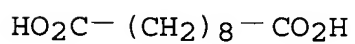
CMF C8 H6 O4



CM 9

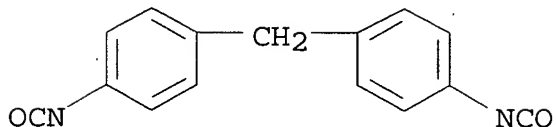
CRN 111-20-6

CMF C10 H18 O4



CM 10

CRN 101-68-8  
CMF C15 H10 N2 O2



RN 225642-69-3 HCAPLUS  
CN 1,2,4-Benzenetricarboxylic acid, polymer with .alpha.-(2-aminomethylethyl)-.omega.-(2-aminomethylethoxy)poly[oxy(methyl-1,2-ethanediyl)], 1,3-benzenedicarboxylic acid, decanedioic acid, 1,3-dihydro-1,3-dioxo-5-isobenzofurancarboxylic acid, 1,3-diisocyanatomethylbenzene, hexanedioic acid, 1,1'-methylenebis[4-isocyanatobenzene], 4,4'-[(1-methylethylidene)bis(4,1-phenyleneoxy)]bis[benzenamine] and Pratherm EP 16 (9CI) (CA INDEX NAME)

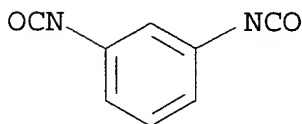
CM 1

CRN 138789-90-9  
CMF Unspecified.  
CCI MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 2

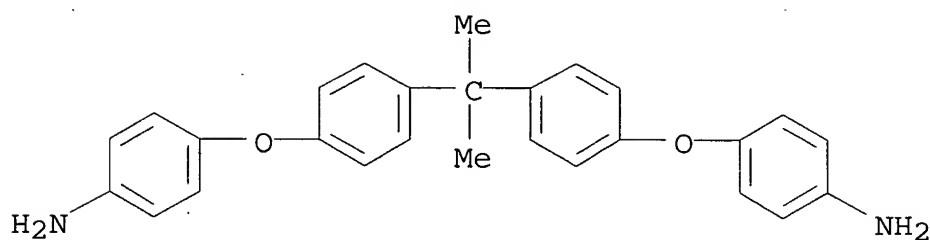
CRN 26471-62-5  
CMF C9 H6 N2 O2  
CCI IDS



D1-Me

CM 3

CRN 13080-86-9  
CMF C27 H26 N2 O2

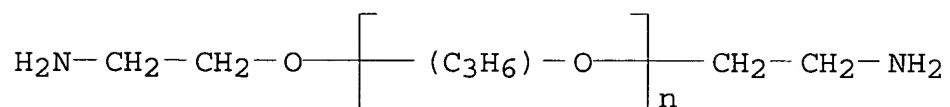


CM 4

CRN 9046-10-0

CMF (C3 H6 O)<sub>n</sub> C6 H16 N2 O

CCI IDS, PMS

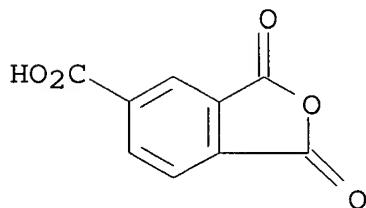


2 ( D1-Me )

CM 5

CRN 552-30-7

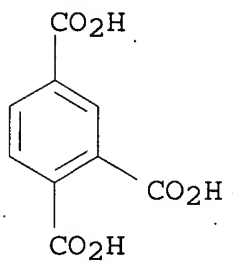
CMF C9 H4 O5



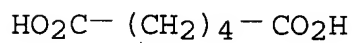
CM 6

CRN 528-44-9

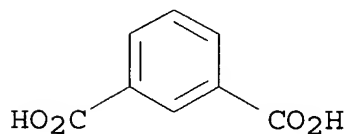
CMF C9 H6 O6



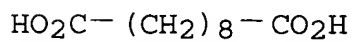
CM 7

CRN 124-04-9  
CMF C6 H10 O4

CM 8

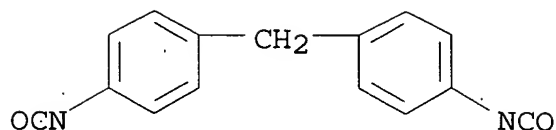
CRN 121-91-5  
CMF C8 H6 O4

CM 9

CRN 111-20-6  
CMF C10 H18 O4

CM 10

CRN 101-68-8  
CMF C15 H10 N2 O2



- IC ICM C08L077-00  
ICS C08L021-00; C08L063-00
- CC 37-6 (Plastics Manufacture and Processing)  
Section cross-reference(s): 38, 76
- IT **Electronic packaging** materials  
(for semiconductor devices; epoxy resin compns. having good heat and moisture resistance and adhesion to polyimide films)
- IT 79-94-7DP, Tetrabromobisphenol A, polymers with polyamide-modified epoxy resins and epoxidized NBR rubber 40039-93-8DP, Epo Tohto YDB 400, polymers with polyamide-modified epoxidized rubbers and epoxidized butadiene rubber 93195-67-6DP, BREN S, polymers with polyamide-modified epoxy resin, epoxidized NBR rubber, and tetrabromobisphenol A 191286-27-8DP, polymers with epoxidized NBR rubber, brominated epoxy resin, and tetrabromobisphenol A 192462-03-6DP, polymers with epoxidized rubbers and brominated epoxy resins 192462-04-7DP, polymers with epoxidized rubbers and brominated epoxy resins **225642-63-7DP**, polymers with **epoxidized** rubbers and brominated epoxy resins **225642-69-3DP**, polymers with **epoxidized** rubbers and brominated epoxy resins 225642-72-8DP, polymers with epoxidized NBR rubber, brominated epoxy resin, and tetrabromobisphenol A 225642-78-4DP, polymers with epoxidized NBR rubber, brominated epoxy resin, and tetrabromobisphenol A 225782-66-1P  
(epoxy resin compns. having good heat and moisture resistance and adhesion to polyimide films)
- L88 ANSWER 14 OF 26 HCAPLUS COPYRIGHT 2003 ACS
- 1999:298431 Document No. 130:353131 Liquid cyanate ester-maleimide resin compositions with excellent electric property and semiconductor devices sealed therewith. Motori, Susumu (Mitsubishi Gas Chemical Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 11124487. A2 19990511 Heisei, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-289750 19971022.
- AB The compns. comprise (A) cyanic acid ester-maleimide resins 25-60, (B) room temp.-liq. epoxy resins 35-70, (C) epoxy-contg. silicone oils premixed with A 0.1-5 (A + B + C = 100), (D) curing agents comprising metal chelates or metal salts 0.1-5, and (E) fillers 100-900 parts. Thus, 2,2-bis(4-cyanatophenyl)propane (I) 1795.5, bis(4-N-maleimidophenyl)methane (II) 94.5, and epoxy-contg. silicone oil (BY 16-855) 210 parts were mixed, then 15 parts of the resulting mixt. was blended with BT 2100B (I/II = 95/5) 15, Epiclon 830LVP (bisphenol F-type epoxy resin) 55, neopentyl glycol diglycidyl ether 15, Fe **acetylacetonate** 1.0, A-187 (.gamma.-glycidoxypropyltrimethoxysilane) 2, spherical SiO<sub>2</sub> 400, and MA-100

(carbon black) 0.5 part to give a compn. with glass-transition temp. 172.degree. and good humidity resistance and a test piece sealed therewith showed reduced warpage and good solder heat resistance.

IT 13963-57-0, Aluminum **acetylacetonate**

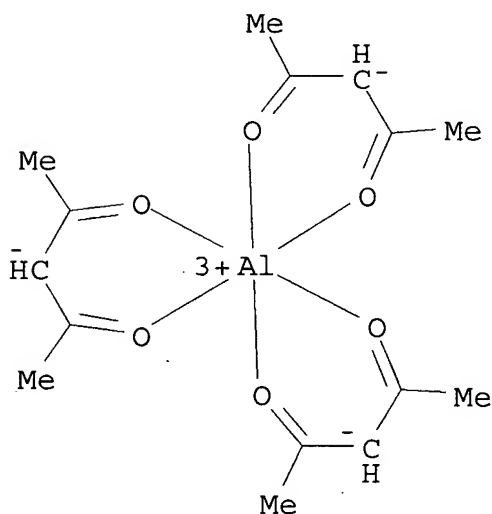
14024-17-0, Iron **acetylacetonate**

14024-18-1, Iron **acetylacetonate**

(curing agent; liq. cyanate ester-maleimide resin compns. for semiconductor device packaging)

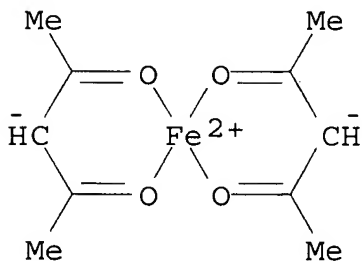
RN 13963-57-0 HCAPLUS

CN Aluminum, tris(2,4-pentanedionato-.kappa.O,.kappa.O')-, (OC-6-11)-(9CI) (CA INDEX NAME)



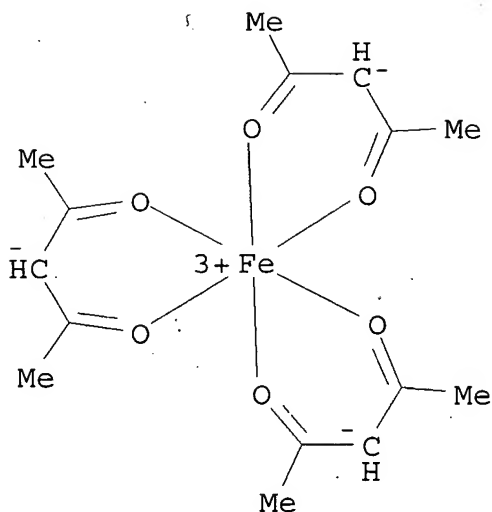
RN 14024-17-0 HCAPLUS

CN Iron, bis(2,4-pentanedionato-.kappa.O,.kappa.O')- (9CI) (CA INDEX NAME)



RN 14024-18-1 HCAPLUS

CN Iron, tris(2,4-pentanedionato-.kappa.O,.kappa.O')-, (OC-6-11)-(9CI) (CA INDEX NAME)



IT 25085-98-7DP, Celloxide 2021, polymers with cyanate ester-bismaleimide resin and epoxy-contg. silicones  
 68508-55-4DP, BT 2100, polymers with epoxy resins and epoxy-contg. silicones  
 (liq. cyanate ester-maleimide resin compns. for semiconductor device packaging)

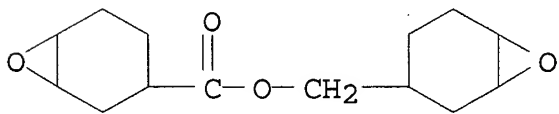
RN 25085-98-7 HCAPLUS

CN 7-Oxabicyclo[4.1.0]heptane-3-carboxylic acid, 7-oxabicyclo[4.1.0]hept-3-ylmethyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 2386-87-0

CMF C14 H20 O4



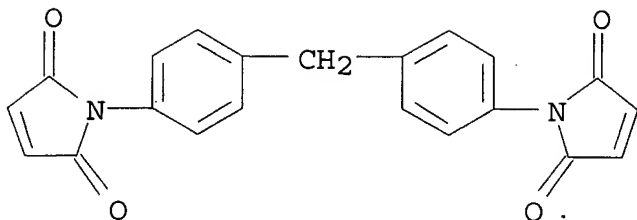
RN 68508-55-4 HCAPLUS

CN Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, polymer with 1,1'-(methylenedi-4,1-phenylene)bis[1H-pyrrole-2,5-dione] (9CI) (CA INDEX NAME)

CM 1

CRN 13676-54-5

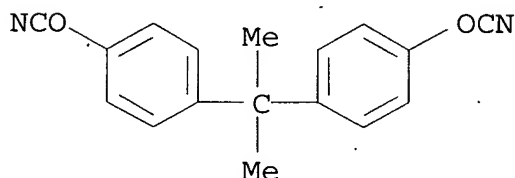
CMF C21 H14 N2 O4



CM 2

CRN 1156-51-0

CMF C17 H14 N2 O2



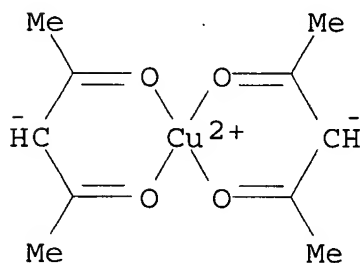
- IC ICM C08L063-00  
ICS C08L079-00; H01L023-29; H01L023-31; C08G059-40; C08G073-06
- CC 37-6 (Plastics Manufacture and Processing)  
Section cross-reference(s): 76
- IT 557-09-5, Zinc octylate 13963-57-0, Aluminum  
**acetylacetonate 14024-17-0, Iron**  
**acetylacetonate 14024-18-1, Iron**  
**acetylacetonate**  
(curing agent; liq. cyanate ester-maleimide resin compns. for semiconductor device packaging)
- IT 1156-51-0DP, 2,2-Bis(4-cyanatophenyl)propane, polymers with epoxy resins and epoxy-contg. silicones 13676-54-5DP, polymers with epoxy resins and epoxy-contg. silicones 17557-23-2DP, Neopentyl glycol diglycidyl ether, polymers with epoxy resins and cyanate ester-bismaleimide resin 25085-98-7DP, Celloxide 2021, polymers with cyanate ester-bismaleimide resin and epoxy-contg. silicones 68508-55-4DP, BT 2100, polymers with epoxy resins and epoxy-contg. silicones 96141-20-7DP, Epiclon 830LVP, polymers with cyanate ester-bismaleimide resin and epoxy-contg. silicones 224428-22-2P 225092-26-2P  
(liq. cyanate ester-maleimide resin compns. for semiconductor device packaging)

L88 ANSWER 15 OF 26 HCAPLUS COPYRIGHT 2003 ACS  
1999:34357 Document No. 130:103778 Materials for semiconductor device assemblies. Chau, Michael M.; Burkhart, Donald A. (Johnson Matthey, Inc., USA). U.S. US 5855821 A 19990105, 6 pp. (English). CODEN:



USXXAM. APPLICATION: US 1995-577256 19951222.

- AB A compn. suitable for use as an underfill for an interconnection between a semiconductor device and a substrate, as a semiconductor device encapsulant, a dam, an adhesive for direct chip attachment, and as an elec. connection for a semiconductor device and a substrate is described. The compn. contains .apprx.40-90% of an elec. conductive or nonconductive filler and a **cyanate** ester and **epoxy** resin component. The **cyanate** ester/**epoxy** resin component comprises .apprx.10-70% **cyanate** ester material, .apprx.30-90% **epoxy** resin, .apprx.0.1-1.5% metal chelate/amine solid curing catalyst and .apprx.0.1-5% coupling agent.
- IT **13395-16-9**, Copper acetylacetonate  
(compns. for semiconductor device assemblies having curing catalysts contg.)
- RN **13395-16-9** HCAPLUS
- CN Copper, bis(2,4-pentanedionato-.kappa.O,.kappa.O')-, (SP-4-1)- (9CI)  
(CA INDEX NAME)



- IC ICM H01B001-22  
ICS C08K003-34; C08K003-36
- NCL 252514000
- CC 76-3 (Electric Phenomena)
- ST semiconductor device assembly compn; interconnection compn semiconductor device; encapsulant compn semiconductor device; chip attachment adhesive compn semiconductor device; **cyanate** ester contg compn semiconductor device assembly; **epoxy** resin contg compn semiconductor device assembly; metal chelate amine catalyst semiconductor device assembly compn; coupling agent contg compn semiconductor device assembly; packaging semiconductor device
- IT **Epoxy** resins, uses  
(bisphenol-based; compns. for semiconductor device assemblies contg.)
- IT **Electronic packaging** materials  
(compns. contg. **cyanate** esters and **epoxy** resins with fillers and curing catalysts and coupling agents)
- IT Clays, uses  
**Cyanates**  
(compns. for semiconductor device assemblies contg.)
- IT 108-95-2D, Phenol, alkyl derivs., uses **13395-16-9**, Copper acetylacetonate 21679-46-9, Cobaltic acetylacetonate

(comps. for semiconductor device assemblies having curing catalysts contg.)

L88 ANSWER 16 OF 26 HCAPLUS COPYRIGHT 2003 ACS

1998:32961 Document No. 128:89332 Synthesis and properties of nonlinear optical side chain soluble polyimides for photonics applications. Lee, Hyung-Lee; Lee, Myung-Hyun; Han, Seon Gyu; Kim, Hye-Young; Ahn, Joo-Heon; Lee, Eun-Mi; Won, Yong Hyub (Photonic Switching Section, Electronics Telecommunications Research Institute, Taejon, 305-600, S. Korea). Journal of Polymer Science, Part A: Polymer Chemistry, 36(2), 301-307 (English) 1998. CODEN: JPACEC. ISSN: 0887-624X. Publisher: John Wiley & Sons, Inc..

AB Arom. polyimides with side chain nonlinear optical chromophores were studied through a facile two-step synthetic route. First, various poly(hydroxyimide)s were synthesized by direct thermal imidization of diaminophenol dihydrochloride salt and arom. dianhydride monomers. The resulting polyimides bearing phenolic hydroxy groups react easily with the terminal hydroxy group on the chromophores via Mitsunobu condensation to give the chromophore-substituted polyimides. The polyimides have high optical nonlinearity and good soly. in common org. solvents. These polyimides have a mol. wt. (Mw) of 31,000 and glass transition temp. above 220.degree., ensuring a long-term alignment stability at elevated temp. The electrooptic coeff.,  $r_{33}$ , of the elec. poled polymer films is 1.8-7.6 pm/V at 1.3  $\mu\text{m}$ .

IT 200870-33-3DP, reaction products with nitrostilbene chromophores

(synthesis and optical properties of side-chain chromophore sol. poly(hydroxyphenyl imide)s for photonics)

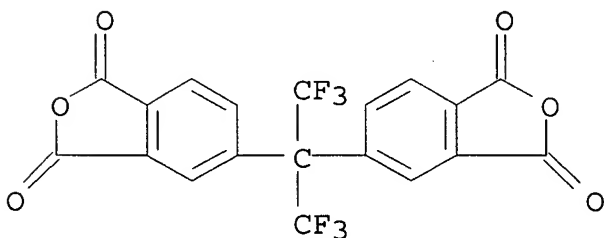
RN 200870-33-3 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis-, polymer with 2,4-diaminophenol dihydrochloride (9CI) (CA INDEX NAME)

CM 1

CRN 1107-00-2

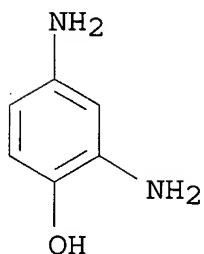
CMF C19 H6 F6 O6



CM 2

CRN 137-09-7

CMF C6 H8 N2 O . 2 Cl H



2 HCl

IT 200870-33-3P

(synthesis and optical properties of side-chain chromophore sol.  
poly(hydroxyphenyl imide)s for photonics)

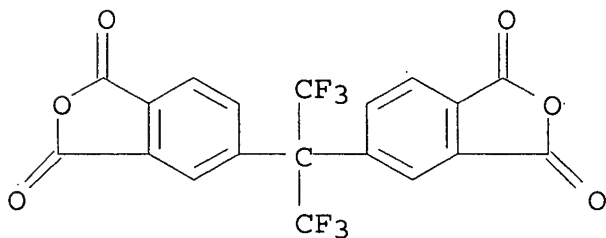
RN 200870-33-3 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis-, polymer with 2,4-diaminophenol dihydrochloride (9CI) (CA INDEX NAME)

CM 1

CRN 1107-00-2

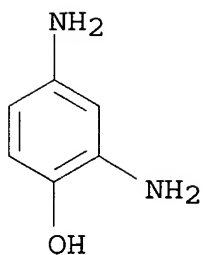
CMF C19 H6 F6 O6



CM 2

CRN 137-09-7

CMF C6 H8 N2 O . 2 Cl H



2 HCl

CC 36-5 (Physical Properties of Synthetic High Polymers)

Section cross-reference(s): 35, 73

IT 2872-52-8DP, reaction products with poly(hydroxyphenyl imide)s

122008-76-8DP, reaction products with poly(hydroxyphenyl imide)s

200870-33-3DP, reaction products with nitrostilbene

chromophores 200870-42-4DP, reaction products with nitrostilbene

chromophores 200960-58-3DP, reaction products with nitrostilbene

chromophores 200960-59-4DP, reaction products with nitrostilbene

chromophores

(synthesis and optical properties of side-chain chromophore sol.  
poly(hydroxyphenyl imide)s for photonics)

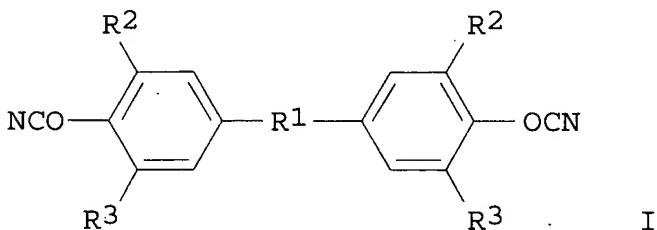
IT 200870-33-3P 200870-42-4P 200960-58-3P 200960-59-4P

(synthesis and optical properties of side-chain chromophore sol.  
poly(hydroxyphenyl imide)s for photonics)

L88 ANSWER 17 OF 26 HCAPLUS COPYRIGHT 2003 ACS

1995:268702 Document No. 122:163069 Thermosetting resin compositions  
for semiconductor sealants. Suzuki, Kenichi; Takeda, Toshiro;  
Enoki, Hisafumi (Sumitomo Bakelite Co, Japan). Jpn. Kokai Tokkyo  
Koho JP 06256625 A2 19940913 Heisei, 5 pp. (Japanese). CODEN:  
JKXXAF. APPLICATION: JP 1993-44040 19930304.

GI



AB Compns. with short hardening time, high glass-transition temp. (Tg),  
low moisture absorption, and good crack resistance comprise (A)

**dicyanate** esters I ( $R_1 = CH_2, CMe_2, C(CF_3)_2, CHMe, O, S,$  direct bond;  $R_2, R_3 = H, Me, Et, CF_3$ ), (B) phenol-modified petroleum resins, phenol-modified coal resins, and/or phenol-modified polybutadienes, (C) **epoxy** resins, (D) bis(2,4-pentanedionato)copper (II), and (E) inorg. fillers. Thus, bis(3,5-dimethyl-4-cyanatophenyl)methane 70, a phenol-modified C5 petroleum resin (23% PhOH) 20, EP 828 (bisphenol A **epoxy** resin) 10, II 0.3, powd. SiO<sub>2</sub> 300, epoxysilane 3, and a higher aliph. acid ester 2 parts were blended to give a compn. showing good hardening at 175.degree. in 1.5 min, which was transfer-molded; the resultant test pieces showed flexural strength 145 MPa, flexural modulus 14.2 GPa, water absorption (72 h, 85.degree., 85% relative humidity) 0.24%, and Tg 203.degree..

IT 25068-38-6, EP 828 71343-77-6, EOCN 102  
(**dicyanate** ester-based rapidly curable thermosetting resin compns. contg. Cu complexes for semiconductor sealants with crack, water, and heat resistance)

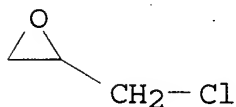
RN 25068-38-6 HCAPLUS

CN Phenol, 4,4'-(1-methylethylidene)bis-, polymer with (chloromethyl)oxirane (9CI) (CA INDEX NAME)

CM 1

CRN 106-89-8

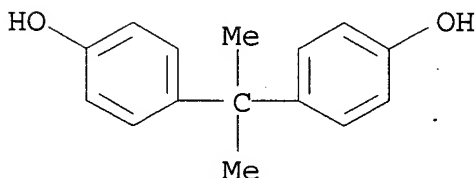
CMF C3 H5 Cl O



CM 2

CRN 80-05-7

CMF C15 H16 O2



RN 71343-77-6 HCAPLUS

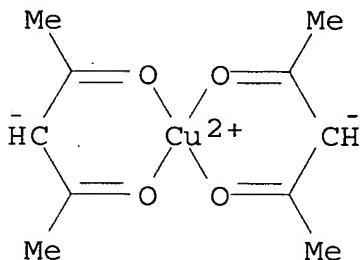
CN EOCN 102 (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

IT 13395-16-9, Bis(2,4-pentanedionato)copper  
 (hardening catalyst; **dicyanate** ester-based rapidly curable thermosetting resin compns. contg. Cu complexes for semiconductor sealants with crack, water, and heat resistance)

RN 13395-16-9 HCAPLUS

CN Copper, bis(2,4-pentanedionato-.kappa.O,.kappa.O')-, (SP-4-1)- (9CI)  
 (CA INDEX NAME)



IC ICM C08L063-00  
 ICS C08L063-00; C08G059-40; C08K003-00; H01L023-29; H01L023-31

CC 38-3 (Plastics Fabrication and Uses)  
 Section cross-reference(s): 37, 76

ST **epoxy** resin blend semiconductor sealant; crack resistance  
**epoxy** resin sealant; moisture absorption **epoxy** resin sealant; **dicyanate** ester **epoxy** semiconductor sealant; phenol modification petroleum resin sealant; coal resin phenol modification sealant; polybutadiene phenol modification semiconductor sealant; pentanedionatocopper complex **epoxy** sealant

IT Crosslinking catalysts  
 (Cu complexes; **dicyanate** ester-based rapidly curable thermosetting resin compns. contg. Cu complexes for semiconductor sealants with crack, water, and heat resistance)

IT **Electronic device packaging**  
 (**dicyanate** ester-based rapidly curable thermosetting resin compns. contg. Cu complexes for semiconductor sealants with crack, water, and heat resistance)

IT **Epoxy** resins, uses  
 (**dicyanate** ester-based rapidly curable thermosetting resin compns. contg. Cu complexes for semiconductor sealants with crack, water, and heat resistance)

IT Petroleum resins  
 (phenol-modified; **dicyanate** ester-based rapidly curable thermosetting resin compns. contg. Cu complexes for semiconductor sealants with crack, water, and heat resistance)

IT 108-95-2D, Phenol, reaction products with coal or petroleum resins or polybutadiene 9003-17-2D, Butadiene homopolymer, reaction products with phenols 25068-38-6, EP 828  
 71343-77-6, EOCN 102 101657-77-6D, Bis(4-cyanato-3,5-dimethylphenyl)methane, polymers  
 (**dicyanate** ester-based rapidly curable thermosetting

resin compns. contg. Cu complexes for semiconductor sealants with crack, water, and heat resistance)

IT 13395-16-9, Bis(2,4-pentanedionato)copper  
(hardening catalyst; **dicyanate** ester-based rapidly curable thermosetting resin compns. contg. Cu complexes for semiconductor sealants with crack, water, and heat resistance)

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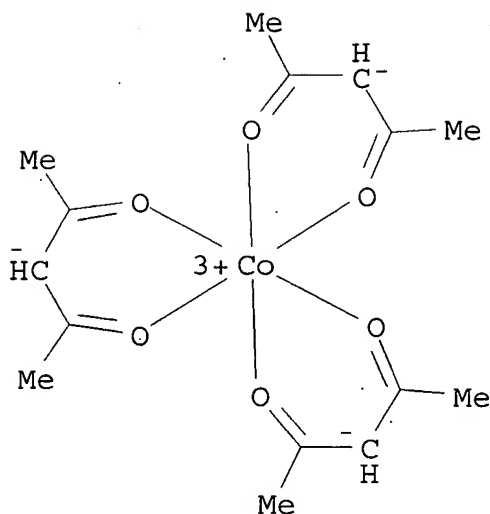
1994:109001 Document No. 120:109001 Adhesive films having a crosslinkable polymer layer and a crosslinking catalyst layer. Emori, Kenji; Ishii, Shigeyoshi (Minnesota Mining and Mfg. Co., USA). PCT Int. Appl. WO 9305122 A1 19930318, 26 pp. DESIGNATED STATES: W: KR; RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, MC, NL, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1992-US6366 19920731. PRIORITY: US 1991-757727 19910911.

AB Rapid-curing, storage-stable adhesive films, useful in manuf. of **printed circuit** assemblies, have a main layer contg. a crosslinkable **cyanate** ester resin of mol. wt. 150-2000 and a thermoplastic resin with mol. wt. 3000-200,000 and a catalyst layer contg. curing agents selected from organometallic compds., metal chelates, and/or org. metal salts and a thermoplastic resin with mol. wt. 3000-200,000, so that the total amt. of thermoplastic resin in both layers is 10-300 parts/100 parts cyanate ester resin. A typical adhesive film comprised a 20-.mu.m layer of a 1:1 (wt. ratio) Arocy B30 [2,2-bis(4-cyanatophenyl)propane polymer]-Slec BBX1 [poly(vinyl butyral)] blend and a 5-.mu.m layer of a 100:5 (wt. ratio) Slec BBX1-cyclopentadienyl iron dicarbonyl dimer mixt.

IT 21679-46-9  
(catalysts, for crosslinking multilayer storage-stable adhesive films contg. **cyanate** ester resins and thermoplastic resins, for manuf. of **printed circuit** assemblies)

RN 21679-46-9 HCAPLUS

CN Cobalt, tris(2,4-pentanedionato-.kappa.O,.kappa.O')-, (OC-6-11)-(9CI) (CA INDEX NAME)



IT 25068-38-6

(crosslinkable **cyanate** ester resin blends with,  
 multilayer adhesive films contg., storage-stable rapid-curing,  
 for manuf. of **printed circuit** assemblies)

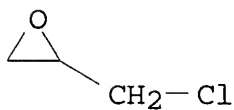
RN 25068-38-6 HCAPLUS

CN Phenol, 4,4'-(1-methylethylidene)bis-, polymer with  
 (chloromethyl)oxirane (9CI) (CA INDEX NAME)

CM 1

CRN 106-89-8

CMF C3 H5 Cl O

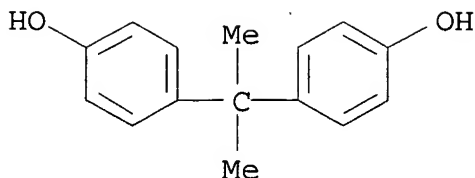


CM 2

CRN 80-05-7

CMF C15 H16 O2





IT 25722-66-1 101657-78-7 101657-80-1

(resin blends with, multilayer crosslinkable adhesive films  
contg., storage-stable rapid-curing, for manuf. of  
**printed circuit** assemblies)

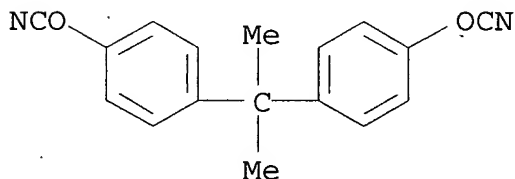
RN 25722-66-1 HCAPLUS

CN Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, homopolymer  
(9CI) (CA INDEX NAME)

CM 1

CRN 1156-51-0

CMF C17 H14 N2 O2



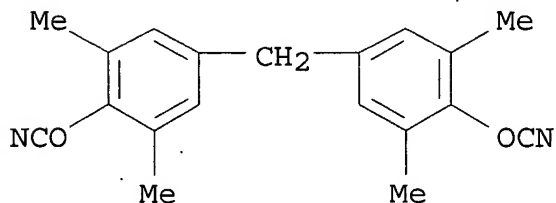
RN 101657-78-7 HCAPLUS

CN Cyanic acid, methylenebis(2,6-dimethyl-4,1-phenylene) ester,  
homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 101657-77-6

CMF C19 H18 N2 O2



RN 101657-80-1 HCAPLUS

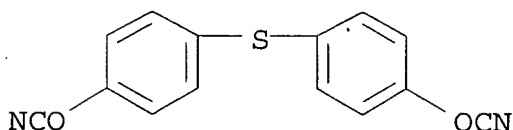
CN Cyanic acid, thiodi-4,1-phenylene ester, homopolymer (9CI) (CA

## INDEX NAME)

CM 1

CRN 101657-79-8

CMF C14 H8 N2 O2 S



- IC ICM C09J007-00  
ICS C09J179-06
- CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 76
- ST polyvinyl butyral biscyanatophenylpropane homopolymer adhesive film;  
**metal** chelate crosslinking **catalyst** adhesive;  
cyclopentadienyl iron dicarbonyl dimer catalyst adhesive; storage  
stable layered adhesive film; **printed circuit**  
assembly layered adhesive film; rapid curing layered adhesive film;  
**cyanate** ester resin adhesive film
- IT Acrylic polymers, uses  
Epoxy resins, uses  
Polyamides, uses  
Polycarbonates, uses  
Polyesters, uses  
Polyethers, uses  
Polyimides, uses  
Polysulfones, uses  
Urethane polymers, uses  
Vinyl acetal polymers  
(crosslinkable **cyanate** ester resin blends with,  
multilayer adhesive films contg., storage-stable rapid-curing,  
for manuf. of **printed circuit** assemblies)
- IT Adhesive tapes  
(multilayer storage-stable rapid-curing, contg. **cyanate**  
ester resin-thermoplastic resin blends in one layer and  
crosslinking catalysts in other, for manuf. of **printed**  
**circuit** assemblies)
- IT Crosslinking catalysts  
(organometallic, for multilayer storage-stable adhesive films  
contg. **cyanate** ester resins and thermoplastic resins,  
for manuf. of **printed circuit** assemblies)
- IT Vinyl acetal polymers  
(butyrals, crosslinkable **cyanate** ester resin blends  
with, multilayer adhesive films contg., storage-stable  
rapid-curing, for manuf. of **printed circuit**  
assemblies)
- IT Naphthenic acids, compounds

- (**copper salts, catalysts**, for crosslinking multilayer storage-stable adhesive films contg. **cyanate ester resins** and thermoplastic resins, for manuf. of **printed circuit** assemblies)
- IT Vinyl acetal polymers  
(formals, crosslinkable **cyanate ester resin** blends with, multilayer adhesive films contg., storage-stable rapid-curing, for manuf. of **printed circuit** assemblies)
- IT Rubber, butadiene-styrene, compounds  
(hydrogenated, block, triblock, maleated, crosslinkable **cyanate ester resin** blends with Tuftec M1913, multilayer adhesive films contg., storage-stable rapid-curing, for manuf. of **printed circuit** assemblies)
- IT **Epoxy resins**, uses  
(phenoxy, crosslinkable **cyanate ester resin** blends with, multilayer adhesive films contg., storage-stable rapid-curing, for manuf. of **printed circuit** assemblies)
- IT Siloxanes and Silicones, uses  
(polycarbonate-, crosslinkable **cyanate ester resin** blends with, multilayer adhesive films contg., storage-stable rapid-curing, for manuf. of **printed circuit** assemblies)
- IT **Polyimides**, uses  
(polyester-, crosslinkable **cyanate ester resin** blends with, multilayer adhesive films contg., storage-stable rapid-curing, for manuf. of **printed circuit** assemblies)
- IT Polyesters, uses  
Siloxanes and Silicones, uses  
(**polyimide**-, crosslinkable **cyanate ester resin** blends with, multilayer adhesive films contg., storage-stable rapid-curing, for manuf. of **printed circuit** assemblies)
- IT **Electric circuits**  
(**printed**, assemblies, adhesive films for manuf. of, storage-stable rapid-curing, contg. crosslinkable polymer layer and crosslinking catalyst layer)
- IT Phenolic resins, uses  
(resol, crosslinkable **cyanate ester resin** blends with, multilayer adhesive films contg., storage-stable rapid-curing, for manuf. of **printed circuit** assemblies)
- IT Polycarbonates, uses  
**Polyimides**, uses  
(siloxane-, crosslinkable **cyanate ester resin** blends with, multilayer adhesive films contg., storage-stable rapid-curing, for manuf. of **printed circuit** assemblies)
- IT 10170-69-1 12154-95-9, Cyclopentadienyl iron dicarbonyl dimer  
15321-51-4 21679-46-9  
(**catalysts**, for crosslinking multilayer storage-stable adhesive

films contg. **cyanate** ester resins and thermoplastic resins, for manuf. of **printed circuit** assemblies)

- IT 9003-35-4, Sumilit PC1 **25068-38-6** 25135-51-7, Udel P1700  
112024-92-7, Elitel UE 3300  
(crosslinkable **cyanate** ester resin blends with, multilayer adhesive films contg., storage-stable rapid-curing, for manuf. of **printed circuit** assemblies)
- IT **25722-66-1** 101657-78-7 101657-80-1  
120026-65-5, XU 71787  
(resin blends with, multilayer crosslinkable adhesive films contg., storage-stable rapid-curing, for manuf. of **printed circuit** assemblies)
- IT 106107-54-4  
(rubber, hydrogenated, block, triblock, maleated, crosslinkable **cyanate** ester resin blends with Tuftec M1913, multilayer adhesive films contg., storage-stable rapid-curing, for manuf. of **printed circuit** assemblies)

L88 ANSWER 19 OF 26 HCAPLUS COPYRIGHT 2003 ACS

1992:573016 Document No. 117:173016 Energy-curable **cyanate** ester resin - thermoplastic polymer adhesive compositions for electronic components. Pujol, Jean Marc P.; Hall, Joyce B.; Hogarton, Peter B.; Tingertal, Jeanne M. (Minnesota Mining and Mfg. Co., USA). PCT Int. Appl. WO 9203516 A1 19920305, 34 pp. DESIGNATED STATES: W: JP, KR; RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, NL, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1991-US5819 19910814. PRIORITY: US 1990-568586 19900820.

AB Energy-curable, one-part adhesive compns., useful for electronic components, comprise a curable **cyanate** ester resin; a thermoplastic polymer; and an organometallic compd. catalysts; and optionally, a silane coupling agent and elec. conductive particles and other additives. An adhesive was prepd. by dissolving in THF poly(vinyl butyral) BX-L, AroCy B-30 (**cyanate** ester), [C5H5Fe(CO)2]2, (3-glycidoxypropyl)trimethoxysilane coupling agent, and Au-Ni-polystyrene conductive particles. The adhesive was cast onto a polyester film and dried to form an adhesive film which was used to bond glass chips to glass slides for 30 s showing shear strength 17.0 MPa.

IT **25722-66-1**, AroCy B-30  
(adhesives contg., curable, for electronic components)

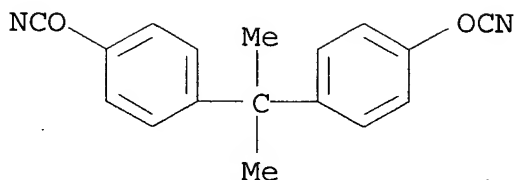
RN **25722-66-1** HCAPLUS

CN Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1156-51-0

CMF C17 H14 N2 O2



- IC ICM C09J179-04  
ICS C08L079-04; C08G073-06
- CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 76
- ST adhesive **cyanate** ester resin blend; thermoplastic blend  
adhesive; polyvinyl butyral blend adhesive; **metal** organo  
**catalyst** adhesive; cyclopentadienyliron carbonyl catalyst  
adhesive; electronic component adhesive
- IT Polyamides, uses  
Polycarbonates, uses  
**Polycyanurates**  
Polyesters, uses  
Polyethers, uses  
**Polyimides**, uses  
Polysulfones, uses  
(adhesives contg., energy-curable, for electronic components)
- IT Crosslinking catalysts  
(organometallic compds., for **cyanate** ester resin  
adhesives)
- IT **Epoxy** resins, uses  
(phenoxy, adhesives contg., energy-curable, for electronic  
components)
- IT **Electric circuits**  
(**printed**, **boards**, adhesives, **cyanate**  
ester resin-thermoplastic polymer-organometallic catalysts  
compns. as)
- IT 1156-51-0, AroCy B-10 25135-51-7, Udel P1700 25667-42-9, Victrex  
5003P 25722-66-1, AroCy B-30  
(adhesives contg., curable, for electronic components)
- IT 12154-95-9, Cyclopentadienyliron dicarbonyl dimer 130972-60-0  
(catalysts, **cyanate** ester adhesives contg., for  
electronic components)
- L88 ANSWER 20 OF 26 HCAPLUS COPYRIGHT 2003 ACS  
1989:116236 Document No. 110:116236 Electrically insulating  
**epoxy** resin adhesive compositions. Hoshida, Shigehiro;  
Ueno, Susumu (Shin-Etsu Chemical Industry Co., Ltd., Japan). Jpn.  
Kokai Tokkyo Koho JP 63183977 A2 19880729 Showa, 6 pp. (Japanese).  
CODEN: JKXXAF. APPLICATION: JP 1987-16657 19870127.
- AB The compns., useful for bonding Cu foils with **polyimide**  
films, comprise dimer acid-based **epoxy** resins 100,  
bismaleimide-triazine resins (derived from a bismaleimide, a  
triazine, and bismaleimide-**cyanate** ester adducts) 50-150,

and nitrile rubber 5-80 parts. Epikote 871 20, a 50% MEK soln. of diphenylmethanebismaleimide-2,2-bis(4-cyanatophenyl)propane reaction products (I) (contg. 50% bismaleimide, 10% triazine, and 40% bismaleimide-**cyanate** ester adducts) 40, a 9% MEK soln. of Hycar CTBN 100, and MEK 70 parts were mixed at 60.degree. for .apprx.4 h, applied to a plasma-treated 50-.mu.m Kapton film to 20 .mu.m thickness, precured at 100.degree. for 10 min, pressed to a 35-.mu.m Cu foil at 110.degree., and postcured at 150.degree. for 5 h. The laminate showed surface resistivity 1 .times. 10<sup>16</sup> .OMEGA., peel strength 1.10 kg/cm, solder heat resistance at 260.degree. >60 s, and flexibility (bending cycles before failure) 12,000, vs. 5 .times. 10<sup>12</sup> .OMEGA., 1.43 kg/cm, >60 s, and 14,500, resp., for a control contg. 10 parts I soln. in place of 40 parts.

IT 68508-55-4 83381-87-7, BT-2170 116438-78-9  
, BT-2164

(**epoxy** resin adhesives contg. nitrile rubber and, elec. insulating, for bonding copper foil with **polyimide** film)

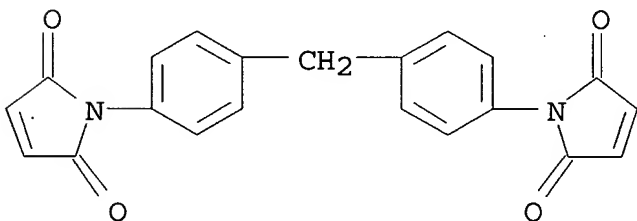
RN 68508-55-4 HCAPLUS

CN Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, polymer with 1,1'-(methylenedi-4,1-phenylene)bis[1H-pyrrole-2,5-dione] (9CI)  
(CA INDEX NAME)

CM 1

CRN 13676-54-5

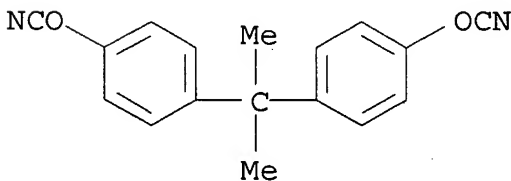
CMF C21 H14 N2 O4



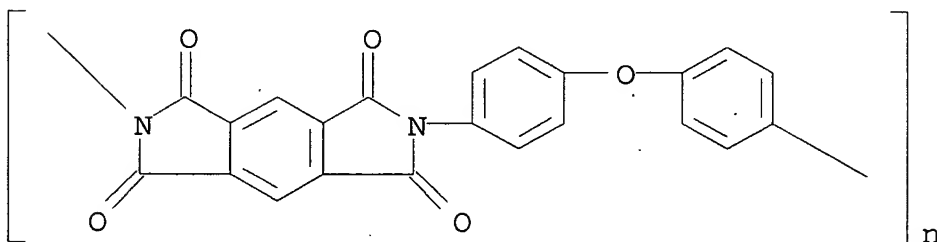
CM 2

CRN 1156-51-0

CMF C17 H14 N2 O2



RN 83381-87-7 HCAPLUS  
 RN 116438-78-9 HCAPLUS  
 IT 25036-53-7, Kapton 25038-81-7  
 (films, bonding to copper foil of, elec. insulating adhesives  
 for)  
 RN 25036-53-7 HCAPLUS  
 CN Poly[(5,7-dihydro-1,3,5,7-tetraoxobenzo[1,2-c:4,5-c']dipyrrole-  
 2,6(1H,3H)-diyl)-1,4-phenyleneoxy-1,4-phenylene] (9CI) (CA INDEX  
 NAME)

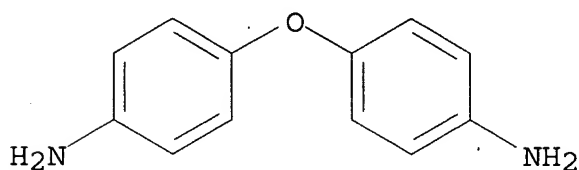


RN 25038-81-7 HCAPLUS  
 CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
 4,4'-oxybis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 101-80-4

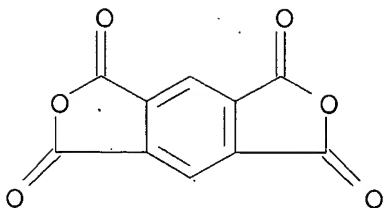
CMF C12 H12 N2 O



CM 2

CRN 89-32-7

CMF C10 H2 O6



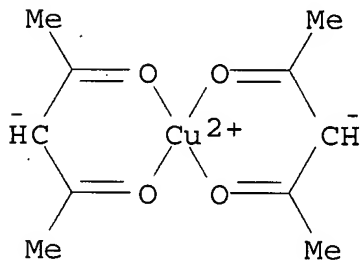
- IC ICM C09J003-16  
ICS C09J003-12; C09J003-16
- CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 37
- ST **epoxy** adhesive elec insulating; bonding copper  
**polyimide epoxy** adhesive; bismaleimide triazine  
resin **epoxy** adhesive; nitrile rubber modified  
**epoxy** adhesive
- IT **Polyimides**, uses and miscellaneous  
(films, lamination of, with copper foil, elec. insulating  
adhesives for)
- IT Lamination  
(of copper foil with **polyimide** film, elec. insulating  
adhesives for)
- IT Electric insulators and **Dielectrics**  
(adhesives, **epoxy resins** contg.  
bismaleimide-triazine resins and nitrile rubber, for bonding  
copper foil with **polyimide** films)
- IT Rubber, nitrile, uses and miscellaneous  
(amine-terminated, **epoxy** resin adhesives contg.  
bismaleimide-triazine resins and Hycar, elec. insulating, for  
bonding copper foil with **polyimide** film)
- IT Rubber, nitrile, uses and miscellaneous  
(carboxy-terminated, **epoxy** resin adhesives contg.  
bismaleimide-triazine resins and Hycar, elec. insulating, for  
bonding copper foil with **polyimide** film)
- IT Adhesives  
(**dielec.**, **epoxy resins** contg.  
bismaleimide-triazine resins and nitrile rubber, for bonding  
copper foil with **polyimide** films)
- IT **Epoxy** resins, uses and miscellaneous  
(dimer acid-based, adhesives, contg. bismaleimide-triazine resins  
and nitrile rubber, elec. insulating, for bonding copper foil  
with **polyimide** film)
- IT Rubber, nitrile, uses and miscellaneous  
(vinyl group-terminated, **epoxy** resin adhesives contg.  
bismaleimide-triazine resins and Hycar, elec. insulating, for  
bonding copper foil with **polyimide** film)
- IT 9085-51-2, Epikote 871 119418-72-3, Epo Tohto YD 172  
(adhesives, contg. bismaleimide-triazine resins and nitrile  
rubber, elec. insulating, for bonding copper foil with  
**polyimide** film)



- IT 68508-55-4 83381-87-7, BT-2170 116438-78-9  
 , BT-2164 118605-84-8, BT-A 135K-A 119524-46-8  
 (epoxy resin adhesives contg. nitrile rubber and, elec.  
 insulating, for bonding copper foil with polyimide  
 film)
- IT 25036-53-7, Kapton 25038-81-7  
 (films, bonding to copper foil of, elec. insulating adhesives  
 for)
- IT 7440-50-8, Copper, uses and miscellaneous  
 (foils, bonding to polyimide film of, elec. insulating  
 adhesives for)
- IT 9003-18-3  
 (rubber, amine-terminated, epoxy resin adhesives contg.  
 bismaleimide-triazine resins and Hycar, elec. insulating, for  
 bonding copper foil with polyimide film)
- IT 9003-18-3  
 (rubber, carboxy-terminated, epoxy resin adhesives  
 contg. bismaleimide-triazine resins and Hycar, elec. insulating,  
 for bonding copper foil with polyimide film)
- IT 9003-18-3  
 (rubber, vinyl group-terminated, epoxy resin adhesives  
 contg. bismaleimide-triazine resins and Hycar, elec. insulating,  
 for bonding copper foil with polyimide film)
- L88 ANSWER 21 OF 26 HCAPLUS COPYRIGHT 2003 ACS
- 1988:591485 Document No. 109:191485 Fire- and moisture-resistant  
 thermosetting epoxy resin compositions. Take, Morio;  
 Ikeguchi, Nobuyuki (Mitsubishi Gas Chemical Co., Inc., Japan). Jpn.  
 Kokai Tokkyo Koho JP 63054419 A2 19880308 Showa, 5 pp. (Japanese).  
 CODEN: JKXXAF. APPLICATION: JP 1986-197993 19860826.
- AB Title compns., useful for laminates, coatings, etc., comprise 10-70  
 parts novolak epoxy resins having phenolic OH content  
 (.chi.OH) .ltoreq.0.02 mequiv/g, free Cl- content (.chi.Cl)  
 .ltoreq.25 ppm, free Na+ content (.chi.Na) .ltoreq.30 ppm, and  
 hydrolyzable Cl content (.chi.h-Cl) .ltoreq.1000 ppm, 10-50 parts  
 brominated novolak epoxy resins having .chi.OH  
 .ltoreq.0.01 mequiv/g, .chi.Cl and .chi.Na .ltoreq.20 ppm, and  
 .chi.h-Cl .ltoreq.1000 ppm, 20-40 parts mixts. or reaction products  
 of 30-100% polyfunctional cyanate esters (or their  
 prepolymers) with 0-70% polyfunctional maleimides (or their  
 prepolymers), and thermal curing catalysts. Thus, a varnish contg.  
 ECN 1273 (epoxy equiv 225, .chi.OH 0.007 mequiv/g) 32,  
 BREN (epoxy equiv 275, Br content 36%, .chi.OH 0.007  
 mequiv/g) 30, 2,2-bis(4-cyanatophenyl)propane-bis(4-  
 maleimidophenyl)methane (90:10) prepolymer (no.-av. mol. wt. 1200)  
 38, Zn octanoate 0.03, and Bz2O2 0.1 part was applied to glass  
 fabric and dried to give prepregs, 8 of which were laminated between  
 Cu foil sheets at 175.degree. and 40 kg/cm2 for 150 min to give a  
 board with Cu adhesion 1.78 kg/cm, water absorption 0.07%,  
 insulation resistance (after 200 h in steam at 2.8 atm) 60 .times.  
 1010 .OMEGA., and UL 94 flame retardance V-0; vs. 1.60, 0.11, 0.8  
 .times. 1010, and HB, resp., for a laminate prepd. similarly without

the ECN 1273 and BREN.

IT 13395-16-9, Copper acetylacetonate  
 (crosslinking catalysts, for epoxy resins with  
 cyanate/maleimide prepolymers)  
 RN 13395-16-9 HCAPLUS  
 CN Copper, bis(2,4-pentanedionato- $\kappa^{\text{O}}$ , $\kappa^{\text{O}'}$ )-, (SP-4-1)- (9CI)  
 (CA INDEX NAME)



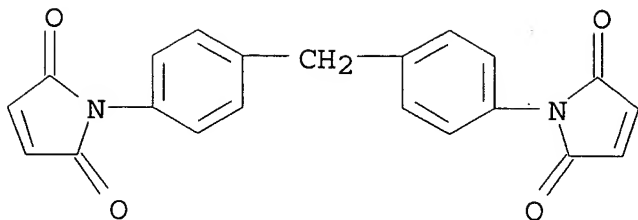
IT 117242-52-1P 117242-53-2P 117268-49-2P  
 (manuf. of, fire- and moisture-resistant)  
 RN 117242-52-1 HCAPLUS  
 CN Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, polymer  
 with Araldite ECN 1273, BREN and 1,1'-(methylenedi-4,1-  
 phenylene)bis[1H-pyrrole-2,5-dione] (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 68859-34-7  
 CMF Unspecified  
 CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 2  
 CRN 37370-68-6  
 CMF Unspecified  
 CCI PMS, MAN

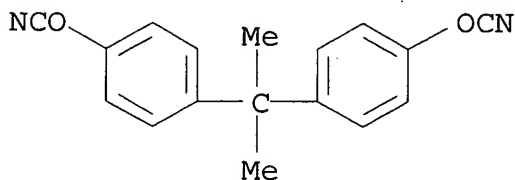
\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 3  
 CRN 13676-54-5  
 CMF C21 H14 N2 O4



CM 4

CRN 1156-51-0  
CMF C17 H14 N2 O2



RN 117242-53-2 HCAPLUS  
CN Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, polymer  
with Araldite ECN 1273 and BREN (9CI) (CA INDEX NAME)

CM 1

CRN 68859-34-7  
CMF Unspecified  
CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

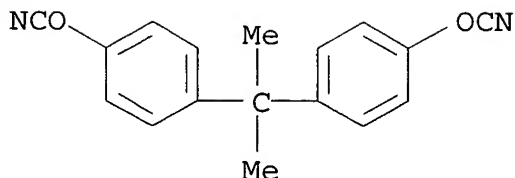
CM 2

CRN 37370-68-6  
CMF Unspecified  
CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 3

CRN 1156-51-0  
CMF C17 H14 N2 O2



RN 117268-49-2 HCAPLUS  
 CN Cyanic acid, 1,3-phenylene ester, polymer with Araldite ECN 1299 and  
 BREN (9CI) (CA INDEX NAME)

CM 1

CRN 68859-34-7  
 CMF Unspecified  
 CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

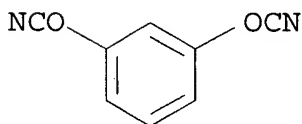
CM 2

CRN 37348-54-2  
 CMF Unspecified  
 CCI MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 3

CRN 1129-88-0  
 CMF C8 H4 N2 O2



IC ICM C08G059-18  
 ICS C08G059-32; C08L063-00  
 CC 37-6 (Plastics Manufacture and Processing)  
 Section cross-reference(s): 38, 42  
 ST **epoxy** resin laminate fireproof waterproof; steam  
 resistance **epoxy** resin laminate; moisture resistance  
 fireproof **epoxy** resin; brominated **epoxy** resin  
 laminate fireproof; **cyanate** ester prepolymer blend  
**epoxy**; maleimide prepolymer blend **epoxy** laminate  
 IT Plastics  
 (**epoxy** resin-brominated **epoxy** resin blends,

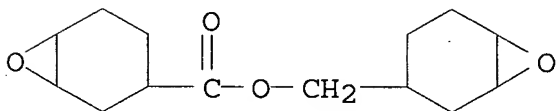
- crosslinked with **cyanate**/maleimide prepolymers, fire- and moisture-resistant)
- IT Fire-resistant materials  
Water-resistant materials  
(novolak **epoxy** resin/brominated **epoxy** resin blends crosslinked with **cyanate**-maleimide prepolymers)
- IT Crosslinking agents  
(polyfunctional maleimide and/or **cyanate** prepolymers, for novolak **epoxy** resin compns. with high moisture resistance)
- IT Fire-resistant materials  
(dielec., moisture-resistant, novolak **epoxy** resin blends crosslinked with **cyanate**/maleimide prepolymers)
- IT Phenolic resins, uses and miscellaneous  
(**epoxy**, novolak, crosslinked with brominated novolak **epoxy** resins and **cyanate**/maleimide prepolymers, fire- and moisture-resistant)
- IT Phenolic resins, uses and miscellaneous  
(**epoxy**, novolak, bromine-contg., crosslinked with novolak **epoxy** resins and **cyanate**/maleimide prepolymers, fire- and moisture-resistant)
- IT Electric insulators and Dielectrics  
(fire- and moisture-resistant, novolak **epoxy** resin blends crosslinked with **cyanate**/maleimide prepolymers)
- IT **Epoxy** resins, uses and miscellaneous  
(phenolic, novolak, crosslinked with brominated novolak **epoxy** resins and **cyanate**/maleimide prepolymers, fire- and moisture-resistant)
- IT **Epoxy** resins, uses and miscellaneous  
(phenolic, novolak, bromine-contg., crosslinked with novolak **epoxy** resins and **cyanate**/maleimide prepolymers, fire- and moisture-resistant)
- IT **Electric circuits**  
(printed, boards, **epoxy** resin-brominated **epoxy** resin blends, crosslinked with **cyanate**/maleimide prepolymers, fire- and moisture-resistant)
- IT 94-36-0, uses and miscellaneous 557-09-5, Zinc octylate  
13395-16-9, Copper acetylacetonate 14024-18-1, Iron acetylacetonate  
(crosslinking catalysts, for **epoxy** resins with **cyanate**/maleimide prepolymers)
- IT 7440-50-8, Copper, uses and miscellaneous  
(laminates with **epoxy** resin/**cyanate**-maleimide prepolymer compns., fire- and moisture-resistant)
- IT 117242-52-1P 117242-53-2P 117268-49-2P  
(manuf. of, fire- and moisture-resistant)

L88 ANSWER 22 OF 26 HCAPLUS COPYRIGHT 2003 ACS

1984:456028 Document No. 101:56028 Thermosetting resin compositions.  
(Mitsubishi Electric Corp., Japan). Jpn. Kokai Tokkyo Koho JP  
58222107 A2 19831223 Showa, 5 pp. (Japanese). CODEN: JKXXAF.

APPLICATION: JP 1982-105064 19820616.

- AB The compns. contain an epoxy resin and a maleimide-triazine resin contg. blocked cyanate groups. The compns. are storage stable and resistant to heat after curing. Thus, 50 g BT 2170 (cyanate equiv 200) was heated 2 h at 60.degree. with 60 g m-cresol to give a blocked polycyanate which was combined with 38 g OY 179 [ 25085-98-7] (epoxy equiv 152) and 2.5 g manganese acetylacetonate to give a thermosetting compn.
- IT 25085-98-7  
(molding compns., contg. blocked cyanate group-contg. maleimide-triazine resins)
- RN 25085-98-7 HCAPLUS
- CN 7-Oxabicyclo[4.1.0]heptane-3-carboxylic acid, 7-oxabicyclo[4.1.0]hept-3-ylmethyl ester, homopolymer (9CI) (CA INDEX NAME)
- CM 1
- CRN 2386-87-0
- CMF C14 H20 O4



- IT 75603-39-3D, reaction products with phenols  
(molding compns., contg. epoxy resins)
- RN 75603-39-3 HCAPLUS
- IC C08G059-40; C08L063-00
- ICA C09D005-25
- ICI C08L063-00, C08L079-04
- CC 37-6 (Plastics Manufacture and Processing)
- IT 25068-38-6 25085-98-7 37348-52-0  
(molding compns., contg. blocked cyanate group-contg. maleimide-triazine resins)
- IT 108-39-4D, reaction products with cyanate group-contg. maleimide-thiazine resins 108-95-2D, reaction products with cyanate group-contg. maleimide-thiazine resins 290-87-9D, derivs., polymers 541-59-3D, derivs., polymers 75603-39-3D, reaction products with phenols  
(molding compns., contg. epoxy resins)
- L88 ANSWER 23 OF 26 HCAPLUS COPYRIGHT 2003 ACS
- 1984:211054 Document No. 100:211054 Bismaleimide-triazine polymer compositions. (International Business Machines Corp., USA). Jpn. Kokai Tokkyo Koho JP 58219257 A2 19831220 Showa, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1983-68513 19830420. PRIORITY: US 1982-388316 19820614.
- AB The title compns., useful in printed circuit boards, formed

storage-stable impregnating varnishes in low-boiling ketone solvents, and cured to form heat-resistant, flame-retardant materials with high elec. resistivity, excellent adhesion to glass fibers, and low thermal expansion. They comprised 70-80% bismaleimide-triazine resins (bismaleimide-dicyanate adducts) and 20-30% brominated epoxy resins (.gtoreq.45% Br) derived from diglycidyl ethers of tetrabromobisphenol. Thus, .apprx.280 parts bisphenol A dicyanate-4,4'-diaminodiphenylmethane-maleic anhydride copolymer [68508-55-4] and .apprx.120 parts Araldite LT-8049 (I) [33294-14-3] (.apprx.50% Br) were combined in acetone/MEK to obtained a varnish which could be stored >9 mo at room temp. This varnish was mixed with 0.2% Zn octanoate catalysts, and applied to glass fiber sheets, which were then dried, and crosslinked by pressing at 175.degree. and 14 g/cm<sup>2</sup> to obtain flame-retardant reinforced boards having glass transition temp. .apprx.200.degree.. A varnish prepd. similarly using Araldite LT-8052 (37-38% Br) instead of I showed ppt. formation after <1 mo storage, and reinforced boards prepd. from it were flammable.

IT 33294-14-3

(bismaleimide-triazine resin blends, storage-stable impregnating varnishes, for printed circuit board manuf.)

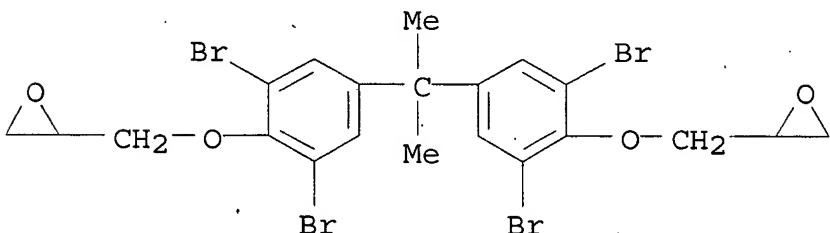
RN 33294-14-3 HCAPLUS

CN Oxirane, 2,2'-[(1-methylethylidene)bis[(2,6-dibromo-4,1-phenylene)oxymethylene]]bis-, homopolymer (9CI) (CA INDEX NAME)

CM 1.

CRN 3072-84-2

CMF C21 H20 Br4 O4



IT 68508-55-4

(brominated epoxy resin blends, storage-stable impregnating varnishes, for printed circuit board manuf.)

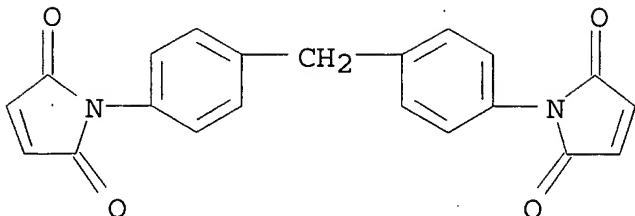
RN 68508-55-4 HCAPLUS

CN Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, polymer with 1,1'-(methylenedi-4,1-phenylene)bis[1H-pyrrole-2,5-dione] (9CI) (CA INDEX NAME)

CM 1

CRN 13676-54-5

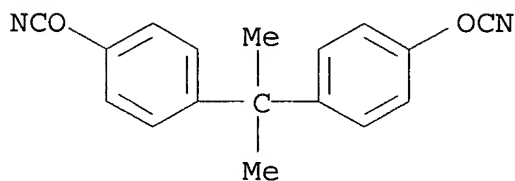
CMF C21 H14 N2 O4



CM 2

CRN 1156-51-0

CMF C17 H14 N2 O2



IC C08L079-08; C08G059-30

ICA C08J005-04; C09D003-58

CC 37-6 (Plastics Manufacture and Processing)

IT 33294-14-3

(bismaleimide-triazine resin blends, storage-stable impregnating varnishes, for printed circuit board manuf.)

IT 68508-55-4

(brominated epoxy resin blends, storage-stable impregnating varnishes, for printed circuit board manuf.)

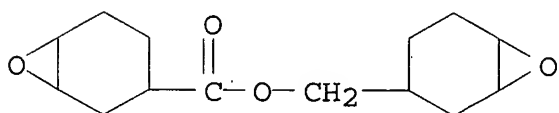
L88 ANSWER 24 OF 26 HCAPLUS COPYRIGHT 2003 ACS

1984:23263 Document No. 100:23263 Heat-hardenable resin compositions. (Mitsubishi Electric Machinery Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 58138725 A2 19830817 Showa, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1982-21613 19820212.

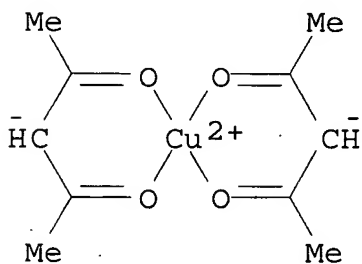
AB Mixts. (1:0.5-5 equiv.) of epoxy resins (epoxy equiv. 150-1000), bismaleimide triazine resins (cyanate equiv. 150-400, e.g. BT 2170 [83381-87-7], BT 2400 [82196-82-5]), and oxazoline ring-forming **catalysts** (preferably **metal acetylacetonates**) are thermosetting. Thus, Araldite CY 179 [25085-98-7] (epoxy equiv. 152) 50, bismaleimide triazine resin (cyanate equiv. 200-210) 50, and Mn(acac)<sub>2</sub> [14024-58-9] 1 g were cured for 3, 3, and 12 h resp. at 110, 160, and 240.degree.. The cures resin had tan .delta. 1%, dielec. const. 3.6, and sp. elec. resistance 3.5 .times. 10<sup>12</sup> .OMEGA.-cm.



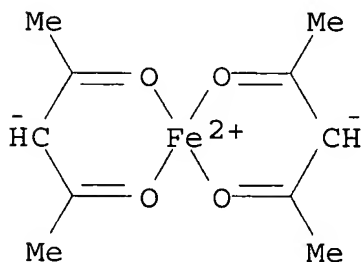
IT 25085-98-7  
 (blends with bismaleimide triazine resins, thermosetting)  
 RN 25085-98-7 HCAPLUS  
 CN 7-Oxabicyclo[4.1.0]heptane-3-carboxylic acid, 7-oxabicyclo[4.1.0]hept-3-ylmethyl ester, homopolymer (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 2386-87-0  
 CMF C14 H20 O4



IT 13395-16-9 14024-17-0 14024-50-1  
 14024-58-9 21679-31-2 21679-46-9  
 (catalyst, for crosslinking of epoxy resin-bismaleimide triazine resin blends)  
 RN 13395-16-9 HCAPLUS  
 CN Copper, bis(2,4-pentanedionato-.kappa.O,.kappa.O')-, (SP-4-1)- (9CI) (CA INDEX NAME)

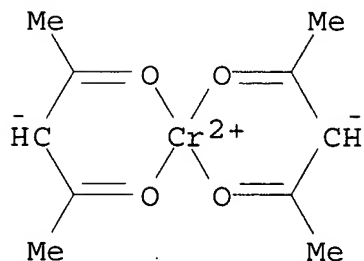


RN 14024-17-0 HCAPLUS  
 CN Iron, bis(2,4-pentanedionato-.kappa.O,.kappa.O')- (9CI) (CA INDEX NAME)



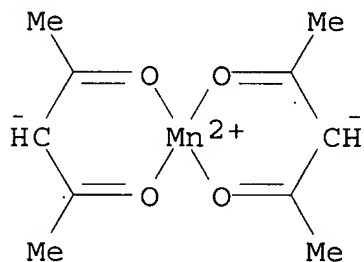
RN 14024-50-1 HCAPLUS

CN Chromium, bis(2,4-pentanedionato-.kappa.O,.kappa.O')-, (SP-4-1) -  
(9CI) (CA INDEX NAME)



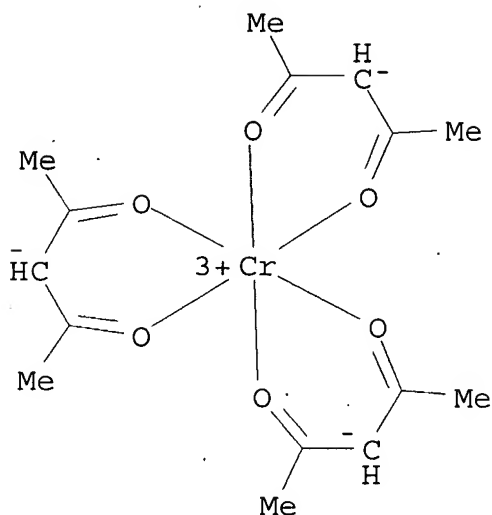
RN 14024-58-9 HCAPLUS

CN Manganese, bis(2,4-pentanedionato-.kappa.O,.kappa.O')- (9CI) (CA  
INDEX NAME)



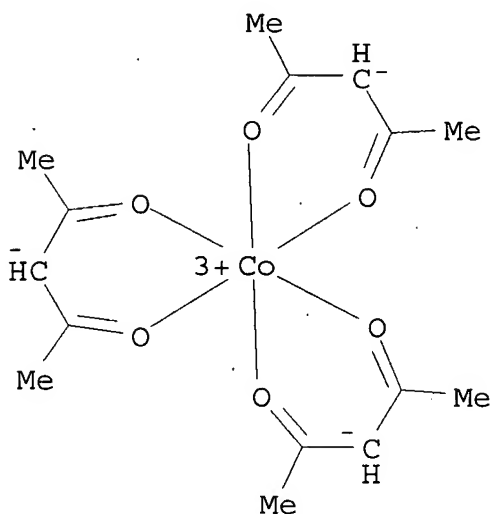
RN 21679-31-2 HCAPLUS

CN Chromium, tris(2,4-pentanedionato-.kappa.O,.kappa.O')-, (OC-6-11) -  
(9CI) (CA INDEX NAME)



RN 21679-46-9 HCAPLUS

CN Cobalt, tris(2,4-pentanedionato-.kappa.O,.kappa.O')-, (OC-6-11)-  
(9CI) (CA INDEX NAME)



IT 82196-82-5 83381-87-7

(epoxy resin blends, thermosetting)

RN 82196-82-5 HCAPLUS

RN 83381-87-7 HCAPLUS

IC C08G059-40

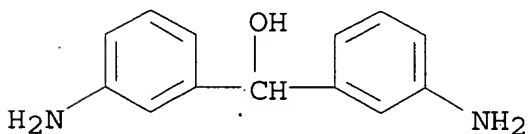
CC 37-6 (Plastics Manufacture and Processing)

ST epoxy resin blend crosslinking; **manganese acetylacetonate catalyst** crosslinking; catalyst crosslinking epoxy blend; maleimide triazine blend crosslinking

IT Crosslinking **catalysts**

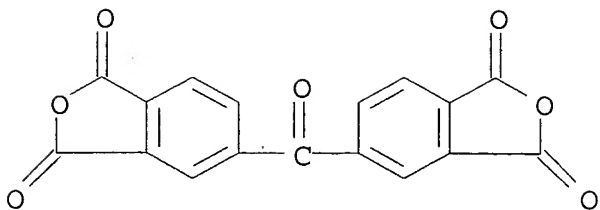
- (metal acetylacetonates, for epoxy resin-bismaleimide triazine resin blends)
- IT 25085-98-7  
(blends with bismaleimide triazine resins, thermosetting)
- IT 13395-16-9 14024-17-0 14024-50-1  
14024-58-9 21679-31-2 21679-46-9  
(catalyst, for crosslinking of epoxy resin-bismaleimide triazine resin blends)
- IT 82196-82-5 83381-87-7  
(epoxy resin blends, thermosetting)
- L88 ANSWER 25 OF 26 HCAPLUS COPYRIGHT 2003 ACS  
1982:163634 Document No. 96:163634 Synthesis and characterization of conductive metal-containing polyimide films. Taylor, L. T.; Carver, V. C.; Furtsch, T. A.; St. Clair, A. K. (Dep. Chem., Virginia Polytech. Inst. and State Univ., Blacksburg, VA, 24061, USA). Organic Coatings and Plastics Chemistry, 43, 635-9 (English) 1980. CODEN: OCPCDG. ISSN: 0161-214X.
- AB Doping of polyimides with metal compds. increased the elec. cond., softening temp., and high temp. adhesive properties, but it adversely affected the decompn. temp. The effects of polyimides prepd. from different monomers, dopant concns., and different atms. are presented and discussed.
- IT 58845-22-0  
(elec. cond. of, contg. metal compds.)
- RN 58845-22-0 HCAPLUS
- CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with 3-amino-.alpha.-(3-aminophenyl)benzenemethanol (9CI) (CA INDEX NAME)

CM 1

CRN 58845-21-9  
CMF C13 H14 N2 O

CM 2

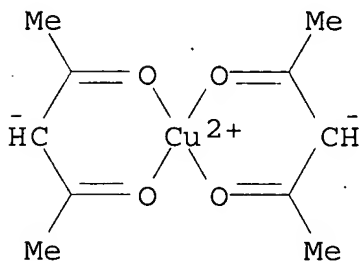
CRN 2421-28-5  
CMF C17 H6 O7



IT 46369-53-3

(polyimides contg., elec. cond. of)

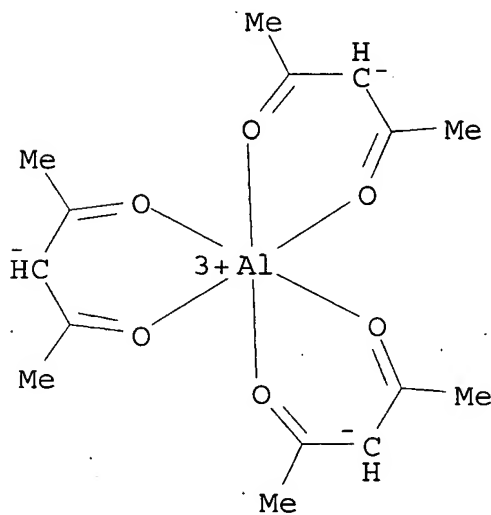
RN 46369-53-3 HCAPLUS

CN Copper, bis(2,4-pentanedionato- $\kappa$ .O, $\kappa$ .O') - (9CI) (CA INDEX NAME)

IT 13963-57-0

(polyimides contg., elec. cond. of)

RN 13963-57-0 HCAPLUS

CN Aluminum, tris(2,4-pentanedionato- $\kappa$ .O, $\kappa$ .O') -, (OC-6-11) - (9CI) (CA INDEX NAME)

CC 37-6 (Plastics Manufacture and Processing)  
IT 24980-39-0 24991-11-5 25036-53-7 25038-81-7 28827-74-9  
51518-44-6 **58845-22-0** 58845-25-3  
(elec. cond. of, contg. metal compds.)  
IT **46369-53-3** 55449-91-7  
(polyimides contg., elec. cond. of)  
IT 7447-41-8, properties 7761-88-8, properties 13453-24-2  
**13963-57-0** 15525-45-8 16903-35-8  
(polyimides contg., elec. cond. of)

L88 ANSWER 26 OF 26 HCAPLUS COPYRIGHT 2003 ACS  
1982:143713 Document No. 96:143713 A study of polyimide properties  
imparted by the addition of lithium ions. Khor, E.; Taylor, Larry  
T. (Dep. Chem., Virginia Polytech. Inst. and State Univ.,  
Blacksburg, VA, 24061-0699, USA). Macromolecules, 15(2), 379-82  
(English) 1982. CODEN: MAMOBX. ISSN: 0024-9297.

AB Lithium additives were used as dopants in poly(amic acid) solns.,  
which, when cured by heating 1 h at 300.degree., produced thin,  
flexible, and antistatic polyimide films. Polyimides derived from  
3,3',4,4'-benzophenonetetracarboxylic dianhydride or pyromellitic  
dianhydride and 3,3'-oxybis[aniline], 3,3'-diaminobenzophenone, or  
3,3'-diaminodiphenylcarbinol were prep'd. Thermogravimetric anal.,  
thermomech. anal., XPS, IR spectroscopy, and elemental anal. were  
used to characterize these films. Elec. cond. increased  
significantly with specific polyimides upon lithium chloride addn.  
The lowered resistivity appeared to be a function of increased  
moisture uptake due to the presence of surface lithium. Other  
lithium dopants, however, while having surface moisture, did not  
produce lower resistivity films.

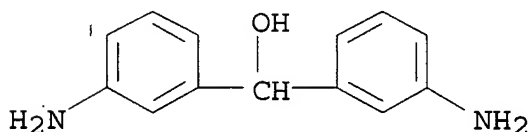
IT **58845-22-0 79984-42-2**  
(elec. resistance of lithium-doped)

RN 58845-22-0 HCAPLUS  
CN 1,3-Isobenzofurandione, 5,5'-carbonylbis-, polymer with  
3-amino-.alpha.-(3-aminophenyl)benzenemethanol (9CI) (CA INDEX  
NAME)

CM 1

CRN 58845-21-9

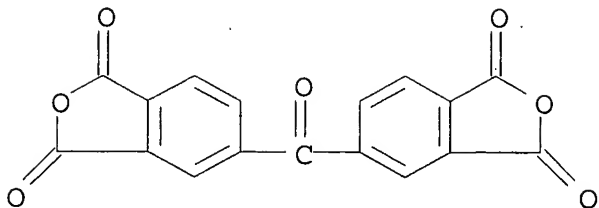
CMF C13 H14 N2 O



CM 2

CRN 2421-28-5

CMF C17 H6 O7



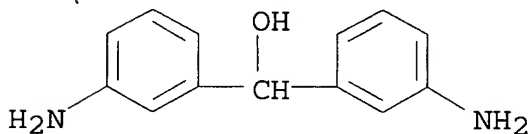
RN 79984-42-2 HCAPLUS

CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with  
3-amino-.alpha.-(3-aminophenyl)benzenemethanol (9CI) (CA INDEX  
NAME)

CM 1

CRN 58845-21-9

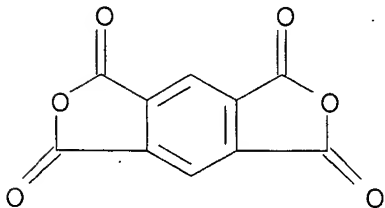
CMF C13 H14 N2 O



CM 2

CRN 89-32-7

CMF C10 H2 O6

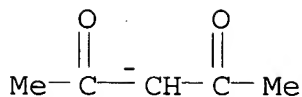


IT 18115-70-3

(polyimides contg., elec. resistance of)

RN 18115-70-3 HCAPLUS

CN 2,4-Pentanedione, ion(1-), lithium (9CI) (CA INDEX NAME)



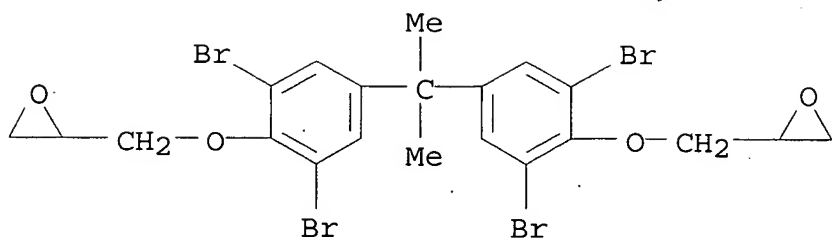
● Li<sup>+</sup>

CC 36-5 (Physical Properties of Synthetic High Polymers)  
 Section cross-reference(s): 76  
 IT 24980-39-0 24991-11-5 25036-53-7 25038-81-7 28827-74-9  
 51518-44-6 **58845-22-0** 58845-25-3 **79984-42-2**  
 79984-43-3  
 (elec. resistance of lithium-doped)  
 IT 7447-41-8, properties 10377-51-2 **18115-70-3**  
 (polyimides contg., elec. resistance of)

=> d 189 1-11 cbib abs hitstr hitind

L89 ANSWER 1 OF 11 HCAPLUS COPYRIGHT 2003 ACS  
 2002:214950 Document No. 136:240164 Thermally conductive adhesive tape  
 for semiconductor devices. Jiang, Tongbi (Micron Technology, Inc.,  
 USA). U.S. US 6359334 B1 20020319, 8 pp. (English). CODEN:  
 USXXAM. APPLICATION: US 1999-327692 19990608.  
 AB A thermally conductive adhesive tape and method for its use in  
 packaging **integrated circuits** fabricated on  
 semiconductor material. The thermally conductive adhesive tape  
 includes a thermally conductive base upon which an adhesive layer is  
 laminated or coated onto .gtoreq.1 side of the thermally conductive  
 base. Thermal energy generated by operating the **integrated**  
**circuit** may be transferred from the **integrated**  
**circuit** via the thermally conductive adhesive tape to a  
 medium to which the semiconductor material is attached. As a  
 result, any excessive heat that may neg. affect the performance of  
 the **integrated circuit** is dissipated through the  
 medium.  
 IT **33294-14-3**, FR-4 **68508-55-4**, BT resin  
 (rigid org. substrate; thermally conductive adhesive tape for  
 semiconductor devices)  
 RN **33294-14-3** HCAPLUS  
 CN Oxirane, 2,2'-[(1-methylethylidene)bis[(2,6-dibromo-4,1-  
 phenylene)oxymethylene]]bis-, homopolymer (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 3072-84-2  
 CMF C21 H20 Br4 O4





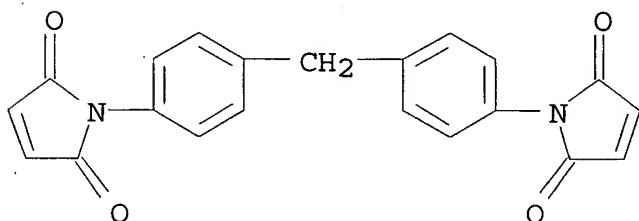
RN 68508-55-4 HCAPLUS

CN Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, polymer  
with 1,1'-(methylenedi-4,1-phenylene)bis[1H-pyrrole-2,5-dione] (9CI)  
(CA INDEX NAME)

CM 1

CRN 13676-54-5

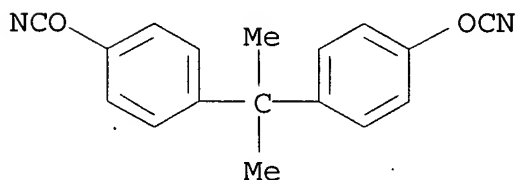
CMF C21 H14 N2 O4



CM 2

CRN 1156-51-0

CMF C17 H14 N2 O2



IC ICM H01L023-10

ICS H01L023-34

NCL 257706000

CC 76-3 (Electric Phenomena)

Section cross-reference(s): 38

IT Polyimides, uses

(adhesives, substrate; thermally conductive adhesive tape for semiconductor devices)

IT **Epoxy** resins, uses  
(adhesives; thermally conductive adhesive tape for semiconductor devices)

IT Adhesive films  
Adhesive tapes  
**Electronic packaging** process  
**Integrated circuits**  
Lead frames  
Semiconductor device fabrication  
(thermally conductive adhesive tape for semiconductor devices)

IT **33294-14-3**, FR-4 61840-02-6, FR 5 (**epoxy** resin)  
**68508-55-4**, BT resin  
(rigid org. substrate; thermally conductive adhesive tape for semiconductor devices)

L89 ANSWER 2 OF 11 HCAPLUS COPYRIGHT 2003 ACS  
2002:185658 \ Document No. 136:240005. Method of pressure curing for reducing voids in a die attach bondline and applications thereof in board-on-chip and lead-on-chip semiconductor device package assembly. Jiang, Tongbi (USA). U.S. Pat. Appl. Publ. US 2002031866 A1 20020314, 8 pp., Division of U. S. Ser. No. 515,579: (English). CODEN: USXXCO. APPLICATION: US 2001-895662 20010629. PRIORITY: US 2000-515579 20000229.

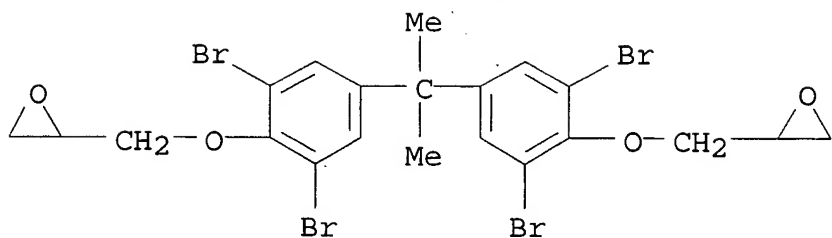
AB A method of curing adhesives of a die attach material to reduce the formation of voids at the resulting bondline, defined by the interface between the adhesive and the surface of a die being attached. The method includes applying a relatively high pressure, in addn. to a relatively high temp., to cure the adhesive material.

IT **33294-14-3**, FR-4 **68508-55-4**, BT resin  
(org. substrate; method of pressure curing for reducing voids in a die attach bondline and applications thereof in board-on-chip and lead-on-chip semiconductor device package assembly)

RN **33294-14-3** HCAPLUS  
CN Oxirane, 2,2'-[(1-methylethylidene)bis[(2,6-dibromo-4,1-phenylene)oxymethylene]]bis-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 3072-84-2  
CMF C21 H20 Br4 O4



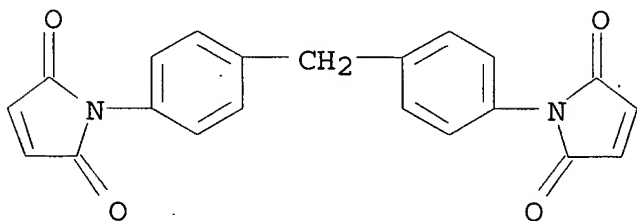
RN 68508-55-4 HCAPLUS

CN Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, polymer  
with 1,1'-(methylenedi-4,1-phenylene)bis[1H-pyrrole-2,5-dione] (9CI)  
(CA INDEX NAME)

CM 1

CRN 13676-54-5

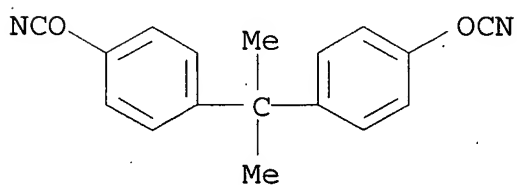
CMF C21 H14 N2 O4



CM 2

CRN 1156-51-0

CMF C17 H14 N2 O2



IC ICM H01L021-44

ICS H01L021-48; H01L021-50

NCL 438125000

CC 76-3 (Electric Phenomena)

Section cross-reference(s): 38

IT Adhesives

## Crosslinking

**Electronic packaging process**

## Lead frames

(method of pressure curing for reducing voids in a die attach bondline and applications thereof in board-on-chip and lead-on-chip semiconductor device package assembly)

IT **Polyimides**, uses

(thermally resistant base; method of pressure curing for reducing voids in a die attach bondline and applications thereof in board-on-chip and lead-on-chip semiconductor device package assembly)

IT **33294-14-3**, FR-4 61840-02-6, FR 5 (**epoxy resin**)  
**68508-55-4**, BT resin

(org. substrate; method of pressure curing for reducing voids in a die attach bondline and applications thereof in board-on-chip and lead-on-chip semiconductor device package assembly)

L89 ANSWER 3 OF 11 HCAPLUS COPYRIGHT 2003 ACS

2001:630928 Document No. 135:188776 Package structure for semiconductor chip. Murayama, Kei (Shinko Electric Industries Co., Ltd., Japan). U.S. US 6281592 B1 20010828, 13 pp. (English). CODEN: USXXAM. APPLICATION: US 1999-262057 19990304. PRIORITY: JP 1998-76525 19980309.

AB A package structure for a semiconductor chip, comprising: a resin substrate having pads formed thereon, a semiconductor chip having electrodes connected to the pads through bumps, an underfiller filling a space between the semiconductor chip and the resin substrate and bonding the semiconductor chip to the resin substrate, and a stiffener or an elastomer buried in the resin substrate in a portion underneath the semiconductor chip to mitigate or absorb a thermal stress acting between the semiconductor chip, the underfiller and the resin substrate, thereby preventing upward depression of the lower surface of the substrate in a portion underneath the semiconductor chip or preventing fracture of the semiconductor chip.

IT **33294-14-3**, FR-4 **68508-55-4**, BT

(substrate; package structure for semiconductor chip)

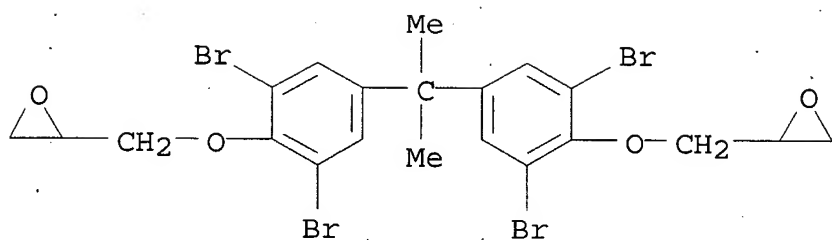
RN **33294-14-3** HCAPLUS

## CN Oxirane, 2,2'-[(1-methylethylidene)bis[(2,6-dibromo-4,1-phenylene)oxymethylene]]bis-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 3072-84-2

CMF C21 H20 Br4 O4



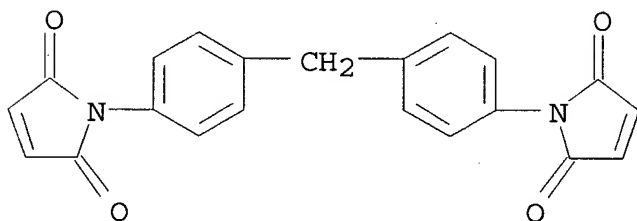
RN 68508-55-4 HCAPLUS

CN Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, polymer  
with 1,1'-(methylenedi-4,1-phenylene)bis[1H-pyrrole-2,5-dione] (9CI)  
(CA INDEX NAME)

CM 1

CRN 13676-54-5

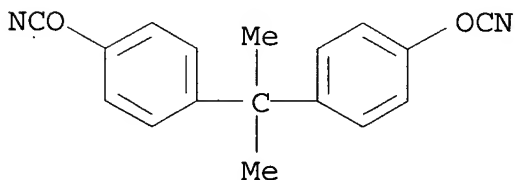
CMF C21 H14 N2 O4



CM 2

CRN 1156-51-0

CMF C17 H14 N2 O2



IC ICM H01L023-28

NCL 257796000

CC 76-3 (Electric Phenomena)

IT **Electronic packages**

**Integrated circuits**

(package structure for semiconductor chip)

IT **Polyimides**, uses  
 (substrate; package structure for semiconductor chip)  
 IT **33294-14-3**, FR-4 **68508-55-4**, BT  
 (substrate; package structure for semiconductor chip)

L89 ANSWER 4 OF 11 HCAPLUS COPYRIGHT 2003 ACS  
 2000:900975 Document No. 134:64919 High density metal layer substrate  
 for **circuit boards** and methods for manufacturing  
 same. Smith, Gordon; Gotro, Jeffrey T.; Hein, Marc; Androff, Nancy  
 M. W. (Alliedsignal Inc., USA).. PCT Int. Appl. WO 2000078107 A1  
 20001221, 38 pp. DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB,  
 BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM,  
 HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU,  
 LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI,  
 SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ,  
 MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK,  
 ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN,  
 TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 2000-US16220  
 20000614. PRIORITY: US 1999-332619 19990614.

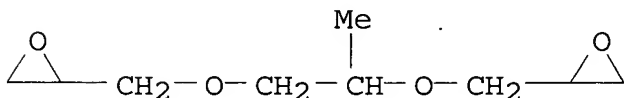
AB This invention concerns ultra-thin metal layer contg. substrates  
 useful for manufg. high d. circuits as well as novel methods for  
 using the substrates to manuf. laminates, circuits, interposers, and  
 other electronic laminates.

IT **30401-87-7**, DER 732 **33294-14-3**, Quatrex 6410  
**68508-55-4**, BT 2110  
 (high d. metal layer substrate for **circuit  
 boards** and methods for manufg. using)

RN 30401-87-7 HCAPLUS  
 CN Oxirane, 2,2'-[(1-methyl-1,2-ethanediyl)bis(oxymethylene)]bis-,  
 homopolymer (9CI) (CA INDEX NAME)

CM 1

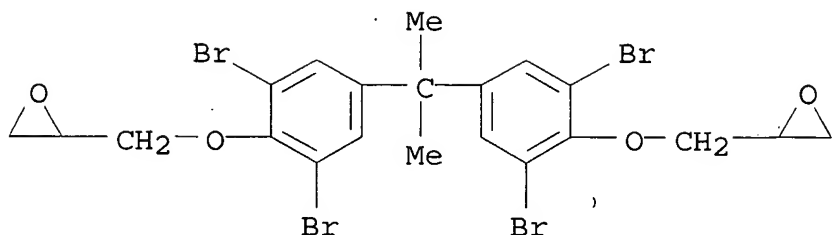
CRN 16096-30-3  
 CMF C9 H16 O4



RN 33294-14-3 HCAPLUS  
 CN Oxirane, 2,2'-[(1-methylethylidene)bis[(2,6-dibromo-4,1-  
 phenylene)oxymethylene]]bis-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 3072-84-2  
 CMF C21 H20 Br4 O4



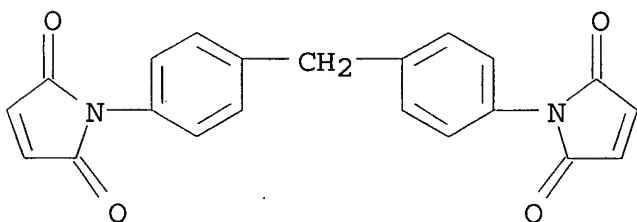
RN 68508-55-4 HCAPLUS

CN Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, polymer  
with 1,1'-(methylenedi-4,1-phenylene)bis[1H-pyrrole-2,5-dione] (9CI)  
(CA INDEX NAME)

CM 1

CRN 13676-54-5

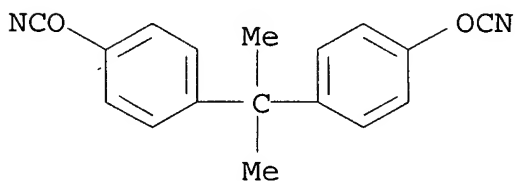
CMF C21 H14 N2 O4



CM 2

CRN 1156-51-0

CMF C17 H14 N2 O2



IC ICM H05K003-02

CC 76-3 (Electric Phenomena)

Section cross-reference(s): 38

ST metal laminate substrate **circuit board**  
fabrication

IT **Polyimides**, processes

(Upilex; high d. metal layer substrate for **circuit**

- boards** and methods for manufg. same)
- IT Castor oil  
(ethoxylated, Surfactol 365; high d. metal layer substrate for **circuit boards** and methods for manufg. using)
- IT Electronic device fabrication  
**Printed circuit boards**  
(high d. metal layer substrate for **circuit boards** and methods for manufg. same)
- IT Metals, processes  
(high d. metal layer substrate for **circuit boards** and methods for manufg. same)
- IT Drilling  
Electrodeposition  
Etching  
Lamination  
Laser radiation  
Parting materials  
Photoresists  
Sputtering  
(high d. metal layer substrate for **circuit boards** and methods for manufg. using)
- IT Fluoropolymers, processes  
Polyesters, processes  
(high d. metal layer substrate for **circuit boards** and methods for manufg. using)
- IT 7440-47-3, Chromium, processes 7440-50-8, Copper, processes  
7440-57-5, Gold, processes 7440-66-6, Zinc, processes  
303130-94-1, FR406  
(high d. metal layer substrate for **circuit boards** and methods for manufg. same)
- IT 9002-84-0, Teflon 313644-02-9, FR 408  
(high d. metal layer substrate for **circuit boards** and methods for manufg. using)
- IT 68-12-2, DMF, processes 78-93-3, Methyl ethyl ketone, processes  
2530-83-8, .gamma.-Glycidoxypropyltrimethoxysilane 9003-39-8,  
PVP-K90 30401-87-7, DER 732 33294-14-3, Quatrex  
6410 68508-55-4, BT 2110 215796-84-2, Paphen PKHS 40  
274924-50-4, EPON 1031A70 313643-97-9, 1138A85  
(high d. metal layer substrate for **circuit boards** and methods for manufg. using)

L89 ANSWER 5 OF 11 HCAPLUS COPYRIGHT 2003 ACS

1999:165527 Document No. 130:274774 Hermetic-equivalent packaging of GPS MCM-L modules for high reliability avionics applications. Hagge, John K.; Camilletti, Robert C. (Rockwell Collins, Inc., Cedar Rapids, IA, 52498, USA). Proceedings - Electronic Components & Technology Conference, 48th, 889-894 (English) 1998. CODEN: PETCES. Publisher: Institute of Electrical and Electronics Engineers.

AB Results are presented of comparative reliability testing of MultiChip Modules (MCMs) fabricated with laminate substrates, and protected with various bare-die coatings. The Demonstration MCMs included two design versions (flip-chip and wire-bond) of the



IT 33294-14-3, FR-4 68508-55-4, BT  
(hermetic-equiv. packaging of GPS MCM-L modules for high  
reliability avionics applications)

CN	Oxirane, 2,2'-[(1-methylethylidene)bis[(2,6-dibromo-4,1-phenylene)oxymethylene]]bis-, homopolymer (9CI) (CA INDEX NAME)
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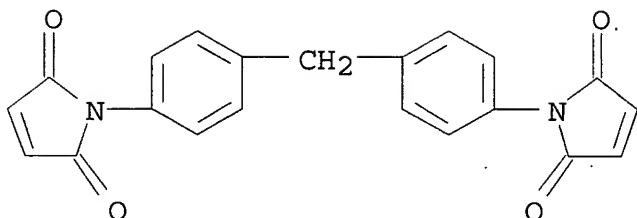
CRN 3072-84-2

Cc1cc(OC2CC2)c(Br)cc1C(C)(C)c3cc(OC4CC4)c(Br)cc3Br

CN    Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, polymer  
with 1,1'-(methylenedi-4,1-phenylene)bis[1H-pyrrole-2,5-dione] (9CI)  
(CA INDEX NAME)

CRN 13676-54-5

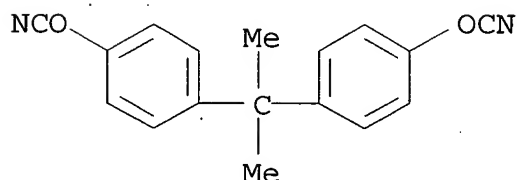
CMF C21 H14 N2 O4



CM 2

CRN 1156-51-0

CMF C17 H14 N2 O2



- CC 76-3 (Electric Phenomena)  
Section cross-reference(s): 38
- IT Aircraft  
Electric failure  
**Electronic packages**  
**Electronic packaging materials**  
Encapsulants  
**Integrated circuits**  
(hermetic-equiv. **packaging** of GPS MCM-L modules for high reliability avionics applications)
- IT **Epoxy** resins, uses  
Polyesters, uses  
**Polyimides**, uses  
(hermetic-equiv. **packaging** of GPS MCM-L modules for high reliability avionics applications)
- IT **33294-14-3**, FR-4 **68508-55-4**, BT 141489-88-5,  
Getek  
(hermetic-equiv. **packaging** of GPS MCM-L modules for high reliability avionics applications)

L89 ANSWER 6 OF 11 HCAPLUS COPYRIGHT 2003 ACS

1999:130375 Document No. 130:197567 Formation of resin-impregnated fiberglass sheets using multiple resins. Appelt, Bernd Karl; Japp, Robert Maynard; Papathomas, Kostantinos; Rudik, William John (International Business Machines Corporation, USA). U.S. US 5874370 A 19990223, 8 pp., Division of U.S. Ser. No. 716,813. (English). CODEN: USXXAM. APPLICATION: US 1997-890197 19970709. PRIORITY: US

1996-716813 19960910.

AB A method and resultant article are provided which optimize the adhesion of resin to the glass fibers in fiberglass cloth impregnated with a resin and also optimize the adhesion of the impregnated resin to metal sheets laminated to the resin-impregnated cloth. The fiberglass is treated in two or more passes. On the first pass, the fiberglass is impregnated with a first resin which is optimized for adherence to glass fibers and the coated resin is partially cured. In a last pass, the fiberglass is impregnated with a second resin, which is different from said first resin, and is optimized for bonding to metal. The second resin is then partially cured. The first and second resins are selected such that they form a bond with each other when cured. The process is useful in prepn. of **integrated circuit** chip carriers.

IT 68508-55-4, BT-2060B

(BT 2060; formation of resin-impregnated fiberglass sheets using multiple resins)

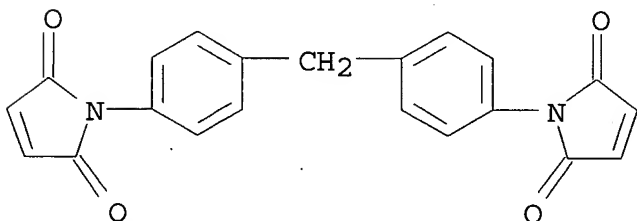
RN 68508-55-4 HCAPLUS

CN Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, polymer with 1,1'-(methylenedi-4,1-phenylene)bis[1H-pyrrole-2,5-dione] (9CI)  
(CA INDEX NAME)

CM 1

CRN 13676-54-5

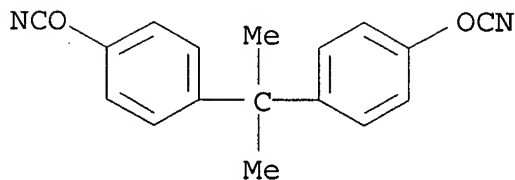
CMF C21 H14 N2 O4



CM 2

CRN 1156-51-0

CMF C17 H14 N2 O2



IT 25068-38-6, Epon 828 30621-65-9, Shell 1031  
 33294-14-3, Araldite 8011  
 (formation of resin-impregnated fiberglass sheets using multiple resins)

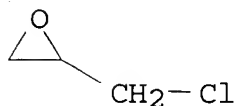
RN 25068-38-6 HCAPLUS

CN Phenol, 4,4'-(1-methylethylidene)bis-, polymer with  
 (chloromethyl)oxirane (9CI) (CA INDEX NAME)

CM 1

CRN 106-89-8

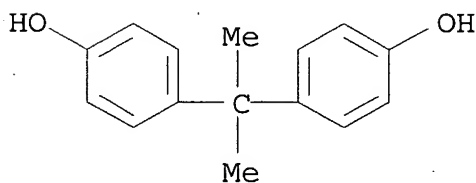
CMF C3 H5 Cl O



CM 2

CRN 80-05-7

CMF C15 H16 O2



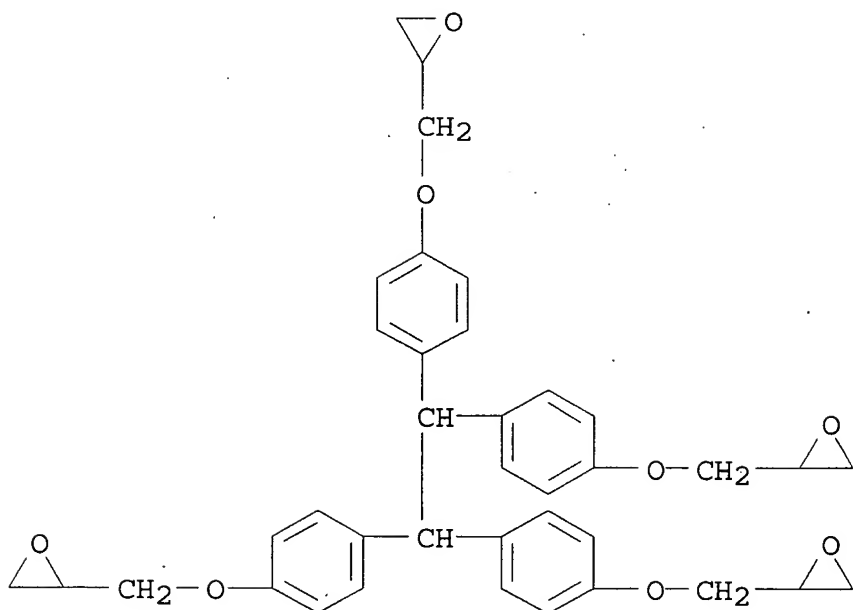
RN 30621-65-9 HCAPLUS

CN Oxirane, 2,2',2'',2'''-[1,2-ethanediylidenetetrakis(4,1-phenyleneoxymethylene)]tetrakis-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 7328-97-4

CMF C38 H38 O8



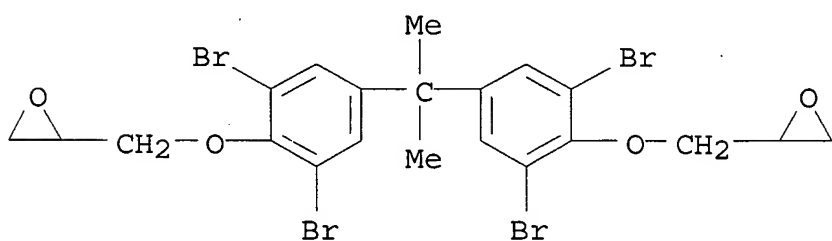
RN 33294-14-3 HCAPLUS

CN Oxirane, 2,2'-[(1-methylethylidene)bis[(2,6-dibromo-4,1-phenylene)oxymethylene]]bis-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 3072-84-2

CMF C21 H20 Br4 O4



IC ICM B32B027-00

ICS B32B031-00

NCL 442064000

CC 38-2 (Plastics Fabrication and Uses)

ST fiber reinforced thermosetting resin; **integrated circuit** chip carrier; adhesion glass fiber thermosetting resin metal

IT **Polyimides**, uses

(bismaleimide-based, triazine-; formation of resin-impregnated fiberglass sheets using multiple resins)

- IT **Polycyanurates**  
(formation of resin-impregnated fiberglass sheets using multiple resins)
- IT **Integrated circuits**  
(mounting **boards**, chip carriers; formation of resin-impregnated fiberglass sheets using multiple resins)
- IT **Epoxy resins, uses**  
(phenolic, novolak; formation of resin-impregnated fiberglass sheets using multiple resins)
- IT **68508-55-4**, BT-2060B  
(BT 2060; formation of resin-impregnated fiberglass sheets using multiple resins)
- IT **25068-38-6**, Epon 828 **30621-65-9**, Shell 1031  
32728-27-1, Arocy F-40S **33294-14-3**, Araldite 8011  
63992-68-7, ECN-1280 153130-99-5, REX-379 220712-77-6, Araldite 8213  
220712-78-7, Araldite 9302 220713-81-5, ECN 199  
(formation of resin-impregnated fiberglass sheets using multiple resins)

L89 ANSWER 7 OF 11 HCAPLUS COPYRIGHT 2003 ACS

1996:397339 Document No. 125:73689 Laser method for plating vias.  
Owen, Mark D. (Electro Scientific Industries, Inc., USA). PCT Int. Appl. WO 9612830 A1 19960502, 40 pp. DESIGNATED STATES: W: CH, DE, JP, KR, SG; RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1995-US8474 19950706. PRIORITY: US 1994-327484 19941020.

AB The output of a continuously pumped, Q-switched, Nd:YAG laser is frequency converted to provide UV light for plating internal wall surfaces of vias in multilayer electronic devices. The parameters of the output pulses are selected to facilitate substantially uniform deposition of plating material particles explosively vaporized from a substrate onto the internal wall surface. These parameters typically include .gtoreq.2 of the following criteria: high av. power of .gtorsim.100 mW measured over the beam spot area, a temporal pulse width shorter than .apprx.100 ns, a spot diam. of .ltorsim.50 .mu.m, and a repetition rate of .gtorsim.1 kHz.

IT **33294-14-3**, FR4 **68508-55-4**, BT (resin)  
(laser plating of vias in multilayer electronic devices contg.)

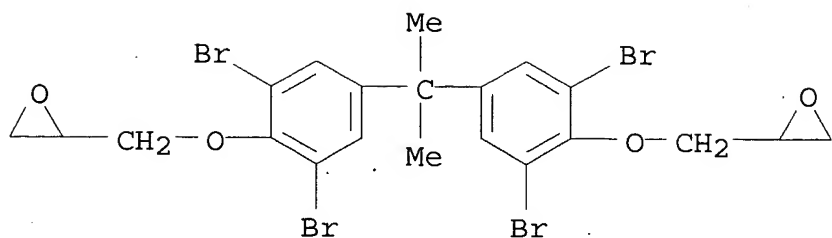
RN 33294-14-3 HCAPLUS

CN Oxirane, 2,2'-[(1-methylethylidene)bis[(2,6-dibromo-4,1-phenylene)oxymethylene]]bis-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 3072-84-2

CMF C21 H20 Br4 O4



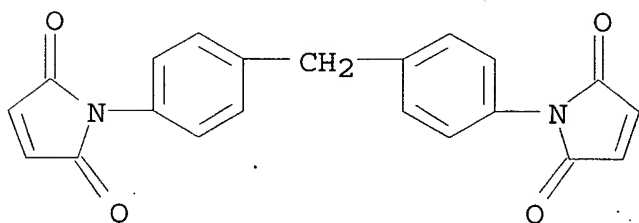
RN 68508-55-4 HCAPLUS

CN Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, polymer  
with 1,1'-(methylenedi-4,1-phenylene)bis[1H-pyrrole-2,5-dione] (9CI)  
(CA INDEX NAME)

CM 1

CRN 13676-54-5

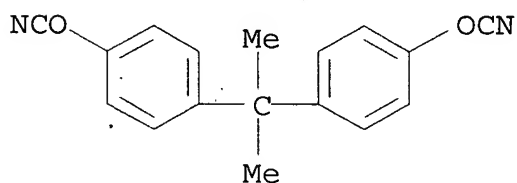
CMF C21 H14 N2 O4



CM 2

CRN 1156-51-0

CMF C17 H14 N2 O2



IC ICM C23C014-04

ICS C23C014-28; H05K003-40; B23K026-00

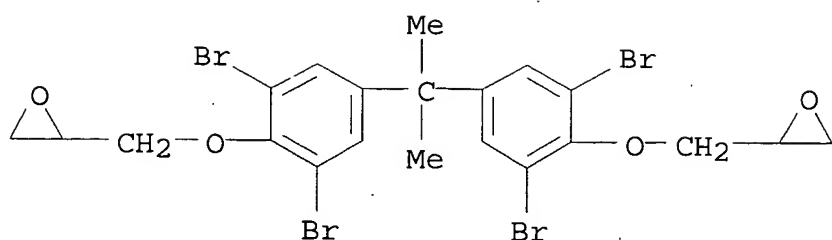
CC 76-3 (Electric Phenomena)

Section cross-reference(s): 73, 75

IT **Electronic device packaging**  
(laser plating of vias for)

- IT Epoxy resins, processes  
Glass fibers, processes  
Phenolic resins, processes  
Polycyanurates  
Polyimides, processes  
(laser plating of vias in multilayer electronic devices contg.)
- IT Electric circuits  
(hybrid, laser plating of vias for)
- IT Electric circuits  
(integrated, multichip modules; laser plating of vias for)
- IT Electric circuits  
(microcircuits, laser plating of vias for)
- IT 694-87-1, Benzocyclobutane 9002-84-0, PTFE 33294-14-3,  
FR4 68508-55-4, BT (resin)  
(laser plating of vias in multilayer electronic devices contg.)
- L89 ANSWER 8 OF 11 HCAPLUS COPYRIGHT 2003 ACS  
1989:440423 Document No. 111:40423 Simultaneous dielectric and dynamic  
mechanical analysis of thermosetting polymers. Gotro, Jeffrey;  
Yandrasits, Michael (Syst. Technol. Div., IBM Corp., Endicott, NY,  
14760, USA). Polymer Engineering and Science, 29(5), 278-84  
(English) 1989. CODEN: PYESAZ. ISSN: 0032-3888.
- AB A method to measure simultaneously the dielec. loss factor and  
viscosity of the thermosetting polymers during various cure cycles  
was presented. A microdielec. sensor was mounted in the bottom  
plate of a parallel plate rheometer. Bismaleimide-triazine resins  
and epoxy resins were studied. During nonisothermal  
curing, dipole peaks were corresponded to softening/devitrification,  
the max. in the loss factor followed the same heating rate  
dependence as the min. in the viscosity, and dipole peaks were  
correlated with vitrification when the cure temp. was below the  
ultimate glass temp. of the resin.
- IT 33294-14-3, FR 4 75602-62-9, BT  
(dielec. loss factor and viscosity of, simultaneous detn. of,  
during crosslinking)
- RN 33294-14-3 HCAPLUS  
CN Oxirane, 2,2'-[(1-methylethylidene)bis[(2,6-dibromo-4,1-  
phenylene)oxymethylene]]bis-, homopolymer (9CI) (CA INDEX NAME)
- CM 1
- CRN 3072-84-2  
CMF C21 H20 Br4 O4





- RN 75602-62-9 HCAPLUS  
 CC 37-5 (Plastics Manufacture and Processing)  
 ST crosslinking **polymer dielec** loss viscosity;  
 bismaleimide triazine resin crosslinking property; **epoxy**  
 resin crosslinking property  
 IT **Epoxy resins**, properties  
 (dielec. loss factor and viscosity of, simultaneous  
 detn. of, during crosslinking)  
 IT Dielectric loss  
 (of bismaleimide-triazine resin and **epoxy** resin, detn.  
 of, during crosslinking)  
 IT Crosslinking  
 (of bismaleimide-triazine resin and **epoxy** resin,  
 simultaneous detn. of dielec. loss factor and viscosity during)  
 IT **Polyimides**, properties  
 (bismaleimide-based, triazine group-contg., dielec. loss factor  
 and viscosity of, simultaneous detn. of, during crosslinking)  
 IT 25639-41-2D, **epoxy resins 33294-14-3**,  
 FR 4 75602-62-9, BT  
 (dielec. loss factor and viscosity of, simultaneous  
 detn. of, during crosslinking)  
 L89 ANSWER 9 OF 11 HCAPLUS COPYRIGHT 2003 ACS  
 1989:76583 Document No. 110:76583 Characterization of a  
 bismaleimide-triazine resin for multilayer **printed**  
**circuit boards**. Gotro, Jeffrey T.; Appelt, Bernd  
 K. (Syst. Technol. Div., IBM, New York, NY, 13760, USA). IBM  
 Journal of Research and Development, 32(5), 616-25 (English) 1988.  
 CODEN: IBMJAE. ISSN: 0018-8646.  
 AB A bromine-contg. **epoxy** resin was blended with a  
 bismaleimide-triazine resin to impart flame resistance for  
**printed circuit board** applications.  
 Curing of the resin was studied using a combination of thermal anal.  
 techniques (thermal anal., heated-cell IR spectroscopy, dynamic  
 mech. anal., and microdielectrometry). DSC indicated .gtoreq.2 sep.  
 reactions. The onset of cyclotrimerization appeared at 150.degree.,  
 correlating with one of the peaks obsd. in the DSC measurements.  
 Dynamic mech. methods were used to study the viscosity profile  
 during simulated lamination temp. profiles. Microdielectrometry  
 performed simultaneously with parallel-plate rheometry provided  
 further insight into the phys. changes that occurred during

lamination.

IT 33294-14-3

(bismaleimide-triazine resin blends, characterization of, for multilayer **printed circuit board** applications)

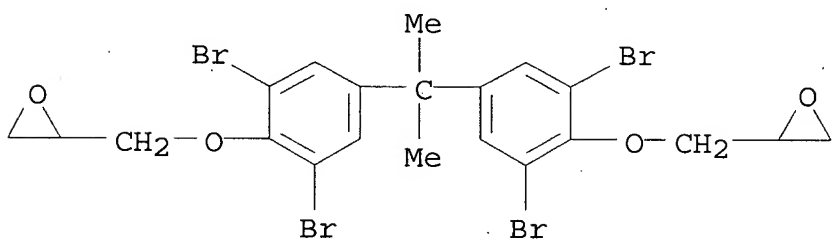
RN 33294-14-3 HCAPLUS

CN Oxirane, 2,2'-[(1-methylethylidene)bis[(2,6-dibromo-4,1-phenylene)oxymethylene]]bis-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 3072-84-2

CMF C21 H20 Br4 O4



IT 68508-55-4

(bromine-contg. **epoxy** resin blends, characterization of, for multilayer **printed circuit board** applications)

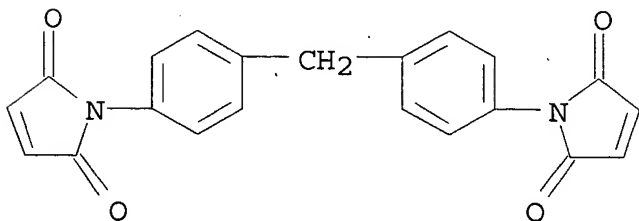
RN 68508-55-4 HCAPLUS

CN Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, polymer with 1,1'-(methylenedi-4,1-phenylene)bis[1H-pyrrole-2,5-dione] (9CI) (CA INDEX NAME)

CM 1

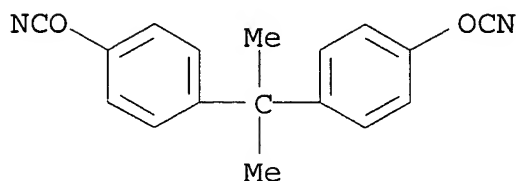
CRN 13676-54-5

CMF C21 H14 N2 O4



CM 2

CRN 1156-51-0  
CMF C17 H14 N2 O2



- CC 37-5 (Plastics Manufacture and Processing)  
Section cross-reference(s): 76
- ST bismaleimide triazine resin characterization; brominated  
**epoxy resin blend; circuit board**  
bismaleimide triazine resin; crosslinking bismaleimide triazine  
resin; lamination bismaleimide triazine resin
- IT Glass fibers, uses and miscellaneous  
(bismaleimide-triazine resin blends with bromine-contg.  
**epoxy resin reinforced with, for multilayer**  
**printed circuit board applications**)
- IT Crosslinking  
Dielectric loss  
Glass temperature and transition  
(of bismaleimide-triazine resin blends with bromine-contg.  
**epoxy resin, for multilayer printed**  
**circuit board applications**)
- IT **Polyimides, properties**  
(bismaleimide-based, bromine-contg. **epoxy resin blends,**  
characterization of, for multilayer **printed**  
**circuit board applications**)
- IT Trimerization  
(cyclo-, of biscyanate in crosslinking of bismaleimide-triazine  
resin blends with bromine-contg. **epoxy resin, for**  
multilayer **printed circuit board**  
applications)
- IT **Electric circuits**  
(**printed, boards,** bismaleimide-triazine resin  
blends with bromine-contg. **epoxy resin for**)
- IT **Epoxy resins, properties**  
(tetrabromobisphenol A-based, bismaleimide-triazine resin blends,  
characterization of, for multilayer **printed**  
**circuit board applications**)
- IT **33294-14-3**  
(bismaleimide-triazine resin blends, characterization of, for  
multilayer **printed circuit board**  
applications)
- IT **68508-55-4**  
(bromine-contg. **epoxy resin blends, characterization**  
of, for multilayer **printed circuit**  
**board applications**)

L89 ANSWER 10 OF 11 HCAPLUS COPYRIGHT 2003 ACS

1988:205970 Document No. 108:205970 Copper-clad polybutadiene-modified epoxy resin laminates for printed circuit boards.

Miyamoto, Fumiyuki; Oka, Seiji; Doi, Makoto; Nakajima, Hiroyuki; Chidai, Hideki (Mitsubishi Electric Corp., Japan). Jpn. Kokai Tokkyo Koho JP 62225536 A2 19871003 Showa, 5 (Japanese). CODEN: JKXXAF. APPLICATION: JP 1986-70247 19860328.

AB Heat-resistant title laminates with good adhesion are manufd. by impregnating base sheets with solns. of 100 parts polybutadiene (I)-modified epoxy resins, 10-100 parts compds. of cyanate esters with bismaleimides, epoxy curing agents, and polymn. catalysts, and drying and hot pressing the resulting prepregs between Cu foil sheets. The modified epoxy resins are prepd. from 1 equiv carboxy-terminated I having .gtoreq.50% repeating units of 1,2-configuration, and 1.2-1.5 equiv epoxy resins. Thus, Nisso PB-C 1000 (II) and DER 332 were mixed (equiv ratio 1:3) in the presence of Me3N+CH2Ph Br- for .apprx.5 h at 135.degree. to give a modified epoxy resin which was mixed with toluene 120, BT 2170 (cyanate polymer) 20, dicyandiamide 3, dicumyl peroxide (III) 2.5, and 1-benzyl-2-methylimidazole 0.3 g, applied to glass cloth sheets, and dried 15 min at 140.degree.. Then 8 of the resulting prepregs were sandwiched between Cu foil sheets and pressed 90 min at 40 kg/cm2 and 170.degree. to give a laminate showing thermal decompn. temp. 300.degree. and Cu adhesion 1.48 kg/cm initially and 1.48 kg/cm after 300 s in solder at 300.degree.; vs. 230.degree. and 0.70 and 0.60 kg/cm, resp., for a control prepd. similarly using 100 g II and 5 g III.

IT 25068-38-6D, Epikote 828, reaction products with carboxy-terminated polybutadiene 25085-99-8D, DER 332, reaction products with carboxy-terminated polybutadiene 33294-14-3D, Epikote 1050, reaction products with carboxy-terminated polybutadiene

(bismaleimide-cyanate polymer blends, copper-clad prepreg laminates with good adhesion)

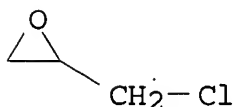
RN 25068-38-6 HCAPLUS

CN Phenol, 4,4'-(1-methylethylidene)bis-, polymer with (chloromethyl)oxirane (9CI) (CA INDEX NAME)

CM 1

CRN 106-89-8

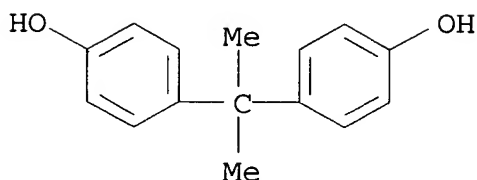
CMF C3 H5 Cl O



CM 2

CRN 80-05-7

CMF C15 H16 O2



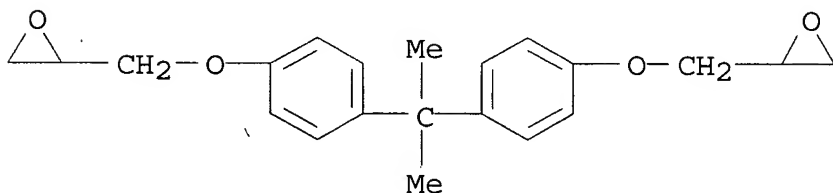
RN 25085-99-8 HCAPLUS

CN Oxirane, 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylenè)]bis-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1675-54-3

CMF C21 H24 O4



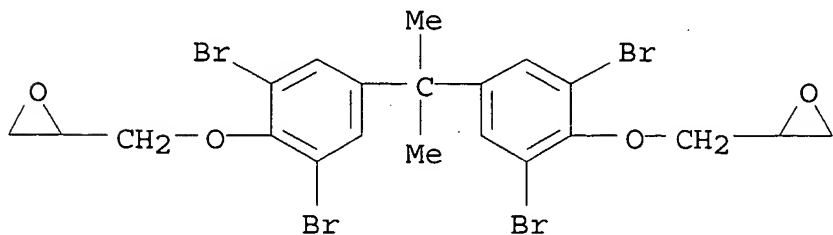
RN 33294-14-3 HCAPLUS

CN Oxirane, 2,2'-[(1-methylethylidenè)bis[(2,6-dibromo-4,1-phenylene)oxymethylene]]bis-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 3072-84-2

CMF C21 H20 Br4 O4



IT 75603-38-2, BT 2100 83381-87-7, BT 2170  
(polybutadiene-modified **epoxy** resin blends, copper-clad  
prepreg laminates with good adhesion)

RN 75603-38-2 HCAPLUS

RN 83381-87-7 HCAPLUS

IC ICM C08J005-24  
ICS B32B007-02; B32B015-08; H05K001-03

CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 39, 76

ST carboxy terminated polybutadiene modified **polyepoxide**;  
polybutadiene modified **epoxy** resin laminate; heat  
resistance modified **epoxy** resin; copper clad **epoxy**  
prepreg laminate; bismaleimide **cyanate** polymer laminate;  
**printed circuit board** laminate adhesion

IT Heat-resistant materials  
(copper-clad polybutadiene-modified **epoxy** resin prepreg  
laminates, contg. bismaleimide-**cyanate** polymers, for  
**printed circuit boards**)

IT Plastics, laminated  
(polybutadiene-modified **epoxy** resin/bismaleimide-  
**cyanate** polymer blends, copper-clad, heat-resistant, with  
good adhesion, for **printed circuit**  
**boards**)

IT **Polyimides**, uses and miscellaneous  
(bismaleimide-based, polybutadiene-modified **epoxy** resin  
blends, copper-clad prepreg laminates with good adhesion)

IT Rubber, butadiene, compounds  
(carboxy-terminated, **epoxy** resins modified with, contg.  
bismaleimide-**cyanate** polymers, copper-clad prepreg  
laminates with good adhesion)

IT **Epoxy** resins, uses and miscellaneous  
(polybutadiene-based, bismaleimide-**cyanate** polymer  
blends, copper-clad prepreg laminates with good adhesion)

IT **Electric circuits**  
(**printed, boards**, copper-clad laminates of  
polybutadiene-modified **epoxy** resin/bismaleimide-  
**cyanate** resin blends, heat-resistant, with good adhesion)

IT 25068-38-6D, Epikote 828, reaction products with  
carboxy-terminated polybutadiene 25085-99-8D, DER 332,  
reaction products with carboxy-terminated polybutadiene  
33294-14-3D, Epikote 1050, reaction products with  
carboxy-terminated polybutadiene 80450-91-5D, reaction products  
with carboxy-terminated polybutadiene 114100-48-0D, reaction  
products with carboxy-terminated polybutadiene  
(bismaleimide-**cyanate** polymer blends, copper-clad  
prepreg laminates with good adhesion)

IT 7440-50-8, uses and miscellaneous  
(foil, polybutadiene-modified **epoxy** resin/bismaleimide-  
**cyanat** resin prepreg laminates, with good heat  
resistance and adhesion)

IT 75603-38-2, BT 2100 83381-87-7, BT 2170

(polybutadiene-modified **epoxy** resin blends, copper-clad prepreg laminates with good adhesion)

IT 9003-17-2

(rubber, carboxy-terminated, **epoxy** resins modified with, contg. bismaleimide-**cyanate** polymers, copper-clad prepreg laminates with good adhesion)

L89 ANSWER 11 OF 11 HCAPLUS COPYRIGHT 2003 ACS

1984:473933 Document No. 101:73933 Bismaleimide triazine composition. Christie, Frederick R.; Daley, Lawrence R. (International Business Machines Corp., USA). Eur. Pat. Appl. EP 102456 A2 19840314, 18 pp. DESIGNATED STATES: R: DE, FR, GB. (English). CODEN: EPXXDW. APPLICATION: EP 1983-105443 19830601. PRIORITY: US 1982-388316 19820614; US 1983-488830 19830426.

AB A compn. useful for prepreg. **elec. circuit**

**boards** comprises a bismaleimide triazine polymeric component, a brominated **epoxy** resin, and a solvent. Thus, BT 2120A [68508-55-4] (bismaleimide triazine compn.) 345.6, Araldite LT 8049 [91261-17-5] (brominated **epoxy** resin) 120.0, MEK 98.4, and acetone 164.0 parts were mixed to give a compn. stable at room temp. for .gtoreq.9 mo. The compn. was mixed with 0.2% of a soln. of 8% Zn octoate in mineral spirits and used to impregnate glass fibers, followed by curing at .apprx.175.degree. and 13.8 .times. 105 N/m2. The product had good fire resistance and a glass transition temp. of .apprx.200.degree..

IT 33294-14-3

(bismaleimide triazine resin blends, glass fiber-reinforced, for **printed circuit boards**)

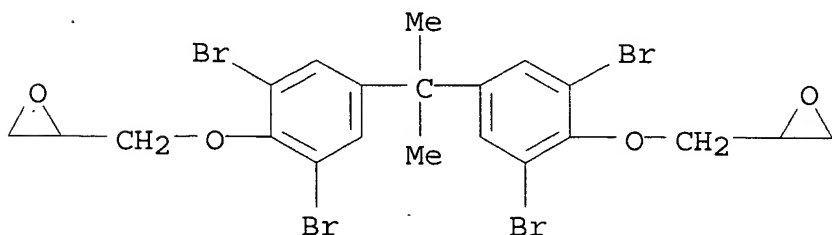
RN 33294-14-3 HCAPLUS

CN Oxirane, 2,2'-[(1-methylethylidene)bis[(2,6-dibromo-4,1-phenylene)oxymethylene]]bis-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 3072-84-2

CMF C21 H20 Br4 O4



IT 68508-55-4

(brominated **epoxy** resin blends, glass fiber-reinforced, for **printed circuit boards**)

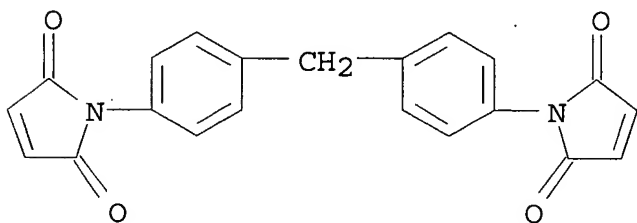
RN 68508-55-4 HCAPLUS

CN Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, polymer with 1,1'-(methylenedi-4,1-phenylene)bis[1H-pyrrole-2,5-dione] (9CI)  
(CA INDEX NAME)

CM 1

CRN 13676-54-5

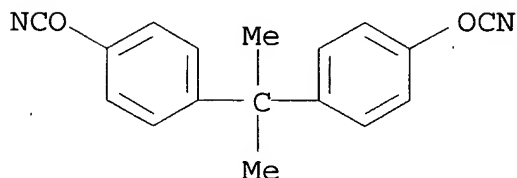
CMF C21 H14 N2 O4



CM 2

CRN 1156-51-0

CMF C17 H14 N2 O2



IC H01B003-30; C08L079-04

CC 38-3 (Plastics Fabrication and Uses)

ST bismaleimide triazine polymer **circuit board**;  
brominated **epoxy resin circuit board**;  
glass fiber plastic **circuit board**

IT Glass fibers, uses and miscellaneous  
(bismaleimide triazine polymer-brominated **epoxy resin**  
blends reinforced by, for **printed circuit**  
**boards**)

IT **Epoxy resins**, uses and miscellaneous  
(brominated, bismaleimide triazine polymer blends, glass  
fiber-reinforced, for **printed circuit**  
**boards**)

IT **Polyimides**, uses and miscellaneous  
(triazine ring-contg., brominated **epoxy resin** blends,  
for **printed circuit boards**)

IT **Electric circuits**  
(**printed, boards**, glass fiber-reinforced)



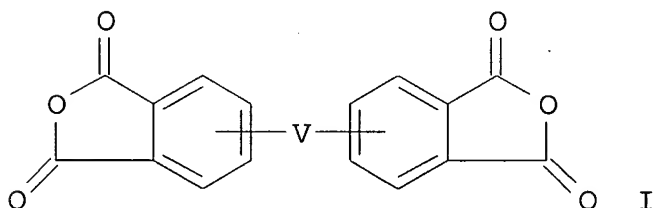
bismaleimide triazine polymer-brominated **epoxy** resins blends for)

- IT 91261-17-5  
(bismaleimide triazine polymer blends, glass fiber-reinforced, for **printed circuit boards**)
- IT 33294-14-3  
(bismaleimide triazine resin blends, glass fiber-reinforced, for **printed circuit boards**)
- IT 290-87-9D, derivs., polymers 541-59-3D, bis derivs., polymers 68508-55-4  
(brominated **epoxy** resin blends, glass fiber-reinforced, for **printed circuit boards**),

=> d (190) *looking for polymers described in 13* 1-16 cbib abs hitstr hitind

L90 ANSWER 1 OF 16 HCAPLUS COPYRIGHT 2003 ACS  
2003:366691 Document No. 138:369908 Flexible copper-clad laminates with good solder heat resistance. Shimoosako, Hiroshi; Ito, Takashi; Nishinaka, Masaru (Kanegafuchi Chemical Industry Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2003136631 A2 20030514, 14 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-338428 20011102.

GI



- AB The laminates include adhesive layers contg. polyimides manufd. from phthalic dianhydrides I (V = O, OT0; T = bifunctional org. group) and diamines and thermosetting resins. Thus, a soln. contained 0.95:0.05:1 1,3-bis(3-aminophenoxy)benzene-3,3'-dihydroxy-4,4'-diaminobiphenyl-4,4'-(4,4'-isopropylidenediphenoxy)bispthalic anhydride copolymer 70, Epikote 1032H60 (novolak **epoxy** resin) 30, and 4,4'-diaminodiphenylsulfone 9 parts. Then, Apical 12.5HP (polyimide film) was coated with the soln., sandwiched with Cu foils, and cured by heating at 200.degree. for 1 h to give a flexible laminate showing peeling strength of the foil 15 and 12 N/cm before and after a pressure cooker test.

- IT 512165-61-6P  
(blends with **epoxy** resins, adhesives; flexible copper-clad laminates with good solder heat resistance)

RN 512165-61-6 HCAPLUS

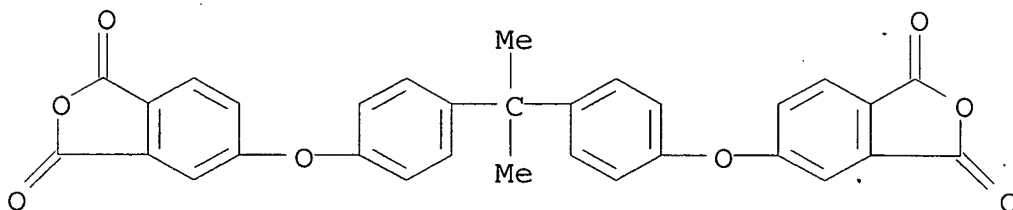
CN 1,3-Isobenzofurandione, 5,5'-[(1-methylethylidene)bis(4,1-phenyleneoxy)]bis-, polymer with 4,4'-diamino[1,1'-biphenyl]-3,3'-

diol and 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 38103-06-9

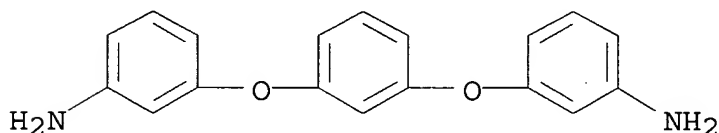
CMF C31 H20 O8



CM 2

CRN 10526-07-5

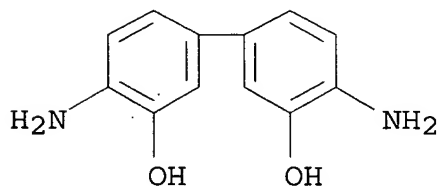
CMF C18 H16 N2 O2



CM 3

CRN 2373-98-0

CMF C12 H12 N2 O2



IC ICM B32B015-08

ICS H05K003-38

CC 38-3 (Plastics Fabrication and Uses)

Section cross-reference(s): 76

ST flexible copper clad laminate polyimide adhesive; isopropyleidene phenoxy phthalic anhydride polyimide adhesive; **printed**

**circuit board** flexible polyimide adhesive;  
**epoxy** resin **polyimide** adhesive copper laminate;  
 hydroxyaminophenyl **polyimide** thermosetting **epoxy**  
 resin adhesive

IT **Polyimides**, uses

(blends with **epoxy** resins, adhesives; flexible  
 copper-clad laminates with good solder heat resistance)

IT **Epoxy** resins, uses

(diamine-crosslinked, blends with polyimides, adhesives; flexible  
 copper-clad laminates with good solder heat resistance)

IT **Printed circuit boards**

(flexible; flexible copper-clad laminates with good solder heat  
 resistance)

IT **Dielectric films**

(polyimides; for flexible copper-clad laminates with good solder  
 heat resistance)

IT 309241-88-1P 309241-89-2P 512165-61-6P

(blends with **epoxy** resins, adhesives; flexible  
 copper-clad laminates with good solder heat resistance)

IT 428855-68-9, Apical 12.5HP

(**dielec. films**; flexible copper-clad  
 laminates with good solder heat resistance)

L90 ANSWER 2 OF 16 HCAPLUS COPYRIGHT 2003 ACS

2003:239929 Document No. 138:256274 Heat-resistant **polyimide**  
**-epoxy** resin adhesive films and their laminates for

build-up **circuit boards**. Zaibe, Satoshi;

Yamazaki, Makoto; Furukawa, Masaya (Nippon Steel Chemical Co., Ltd.,  
 Japan). Jpn. Kokai Tokkyo Koho JP 2003089784 A2 20030328, 7 pp.

(Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-282900 20010918.

AB The films include 100 parts org.-solvent-sol. polyimides comprising  
 tetracarboxylic dianhydrides and diamines contg. 5-20 mol%  
 diaminosiloxanes, 5-45 parts **epoxy** resins having softening  
 point of 55-70.degree., and 0.1-20 parts silane coupling agents.

Thus, films comprising 0.110:0.015:0.090:0.004 3,3',4,4'-  
 diphenylsulfonyltetracarboxylic dianhydride-BY 16-853X

(aminopropyl-terminated polydimethylsiloxane)-2,2'-bis(4-  
 aminophenoxyphenyl)propane-4,4'-diamino-3,3'-dihydroxybiphenyl

copolymer 100 (as solid), bromocresol novolak **epoxy** resin  
 (softening point 63.degree.) 33, and 3-mercaptopropyltrimethoxysilan  
 e 0.5 part were alternatively laminated with Cu foils, pierced, and  
 plated with Cu to give a two-layered build-up **circuit**  
**board** showing good shape retention and no disconnection  
 after thermal shock test.

IT 502632-03-3P

(heat-resistant **polyimide-epoxy** resin  
 adhesive films for build-up **circuit boards**)

RN 502632-03-3 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-sulfonylbis-, polymer with  
 .alpha.-[(3-aminopropyl)dimethylsilyl]-.omega.-[[[(3-  
 aminopropyl)dimethylsilyl]oxy]poly[oxy(dimethylsilylene)],  
 4,4'-diamino[1,1'-biphenyl]-3,3'-diol and 4,4'-[(1-

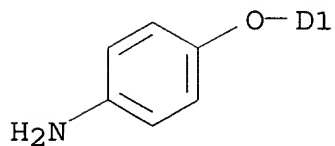
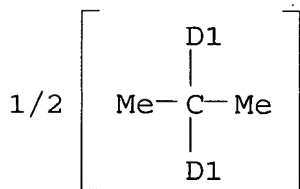
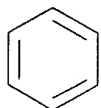
methylethylidene)bis(phenyleneoxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 143074-26-4

CMF C27 H26 N2 O2

CCI IDS

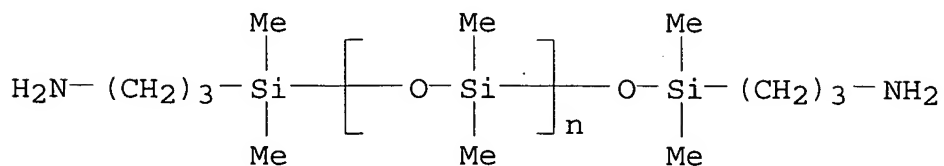


CM 2

CRN 97917-34-5

CMF (C2 H6 O Si)<sub>n</sub> C10 H28 N2 O Si2

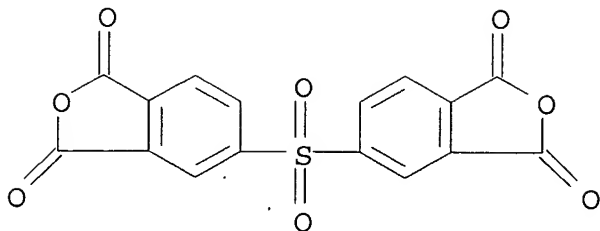
CCI PMS



CM 3

CRN 2540-99-0

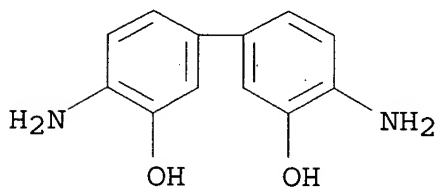
CMF C16 H6 O8 S



CM 4

CRN 2373-98-0

CMF C12 H12 N2 O2

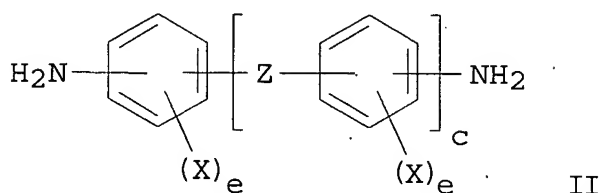
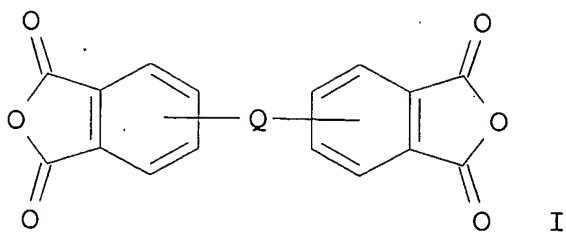


- IC ICM C09J179-08  
ICS C09J007-00; C09J163-00; H05K003-46
- CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 76
- ST **polyimide epoxy resin dielec  
adhesive film; printed circuit  
board** reliability polyimide film; aminopropyl  
polydimethylsiloxane polyimide **dielec film**;  
bromocresol novolak **epoxy resin dielec  
film**
- IT Phenolic resins, uses  
(**epoxy**, novolak, bromine-contg.; heat-resistant  
**polyimide-epoxy** resin adhesive films for  
build-up **circuit boards**)
- IT Phenolic resins, uses  
(**epoxy**, novolak, bromocresol-based; heat-resistant  
**polyimide-epoxy** resin adhesive films for  
build-up **circuit boards**)
- IT **Dielectric films**  
(heat-resistant **polyimide-epoxy** resin  
adhesive films for build-up **circuit boards**)
- IT **Adhesive films**  
(heat-resistant; heat-resistant **polyimide-epoxy**  
resin adhesive films for build-up **circuit**

- boards)
- IT **Printed circuit boards**  
(multilayer; heat-resistant **polyimide-epoxy** resin adhesive films for build-up **circuit boards**)
- IT **Epoxy resins, uses**  
(phenolic, novolak, bromine-contg.; heat-resistant **polyimide-epoxy** resin adhesive films for build-up **circuit boards**)
- IT **Epoxy resins, uses**  
(phenolic, novolak, bromocresol-based; heat-resistant **polyimide-epoxy** resin adhesive films for build-up **circuit boards**)
- IT Polysiloxanes, uses  
(**polyimide-**; heat-resistant **polyimide-epoxy** resin adhesive films for build-up **circuit boards**)
- IT Polymer blends  
(**polyimide-epoxy** resin blends; heat-resistant **polyimide-epoxy** resin adhesive films for build-up **circuit boards**)
- IT Polyimides, uses  
(polysiloxane-; heat-resistant **polyimide-epoxy** resin adhesive films for build-up **circuit boards**)
- IT **502632-03-3P**  
(heat-resistant **polyimide-epoxy** resin adhesive films for build-up **circuit boards**)
- IT 25053-96-7D, o-Cresol-formaldehyde copolymer, glycidyl ether  
502632-04-4D, Bromocresol-formaldehyde copolymer, glycidyl ether  
(heat-resistant **polyimide-epoxy** resin adhesive films for build-up **circuit boards**)

L90 ANSWER 3 OF 16 HCAPLUS COPYRIGHT 2003 ACS  
 2003:58168 Document No. 138:107937 Resin compositions with heat-resistant adhesion. Shimo-Ohsako, Kanji; Itoh, Takashi; Nishinaka, Masaru; Tanaka, Shigeru; Murakami, Mutsuaki (Kaneka Corporation, Japan). PCT Int. Appl. WO 2003006553 A1 20030123, 60 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (Japanese). CODEN: PIXXD2. APPLICATION: WO 2002-JP6890 20020708. PRIORITY: JP 2001-208606 20010709; JP 2001-348287 20011114; JP 2001-348303 20011114.

GI



AB Title compns., curable at a relatively low temp., comprise thermosetting resins and polyimides prepd. from specific dianhydride I (Q = O, ORO, COOROOC, R = divalent org. group) and specific diamines  $\text{NH}_2\text{C}_6\text{H}_4(\text{YC}_6\text{H}_4\text{Y})\text{aC}_6\text{H}_4\text{NH}_2$  [Y = CO, SO<sub>2</sub>, O, S, (CH<sub>2</sub>)<sub>b</sub>, NHCO, C(CH<sub>3</sub>)<sub>2</sub>, C(CF<sub>3</sub>)<sub>2</sub>, COO; a, b = 0-5 integer] and/or II [X = OH, COOH, OCN, CN; Z = CO, SO<sub>2</sub>, O, S, (CH<sub>2</sub>)<sub>b</sub>, NHCO, C(CH<sub>3</sub>)<sub>2</sub>, C(CF<sub>3</sub>)<sub>2</sub>, COO; b, c = 0-5 integer; e = 1-4 integer]. Coating both sides of a polyimide film with a dioxolane soln. contg. 1,3-bis(3-aminophenoxy)benzene-3,3'-dihydroxy-4,4'-diaminophenyl-4,4'-(4,4'-isopropylidenediphenoxy)bispthalic anhydride copolymer, Epikote 1032H60, and 4,4'-diaminodiphenylsulfone and hot-laminating one side with a Cu foil gave a laminate, the adhesive side of which was pressed with a thick Cu foil at 200.degree. for 60 min to form a product showing adhesion between the thick Cu foil and laminate of 10.0 N/cm initially and 7.0 N/cm after pressure-cooker test and good 260.degree. resistance.

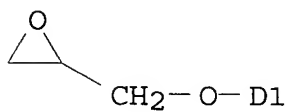
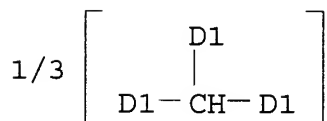
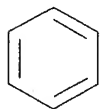
IT **488152-95-0P**, 1,3-Bis(3-aminophenoxy)benzene-3,3'-dihydroxy-4,4'-diaminophenyl-4,4'-(4,4'-isopropylidenediphenoxy)bispthalic anhydride-4,4'-diaminodiphenylsulfone-triphenylolmethane triglycidyl ether copolymer

(low-temp.-curable specific polyimide and thermosetting resin compns. for heat-resistant adhesives for **printed circuit boards**)

RN **488152-95-0 HCAPLUS**

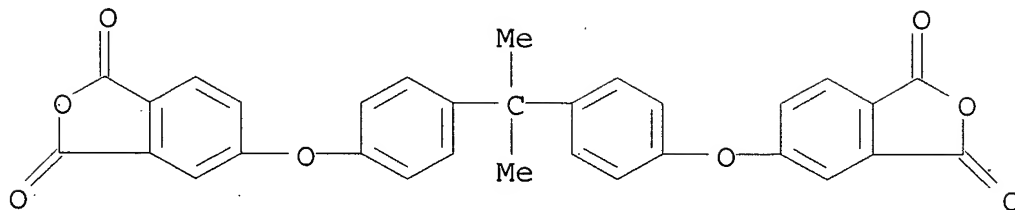
CN 1,3-Isobenzofurandione, 5,5'-[(1-methylethylidene)bis(4,1-phenyleneoxy)]bis-, polymer with 4,4'-diamino[1,1'-biphenyl]-3,3'-diol, 2,2',2''-[methylidynetris(phenyleneoxymethylene)]tris[oxirane], 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] and 4,4'-sulfonylbis[benzenamine] (9CI) (CA INDEX NAME)

CRN 66072-38-6  
CMF C28 H28 O6  
CCI IDS



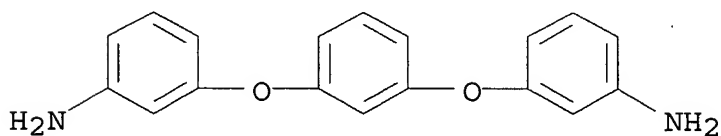
CM 2

CRN 38103-06-9  
CMF C31 H20 O8



CM 3

CRN 10526-07-5  
CMF C18 H16 N2 O2

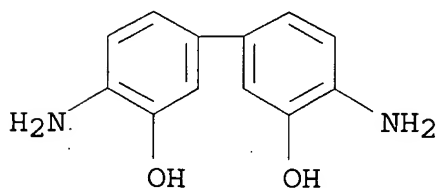




CM 4

CRN 2373-98-0

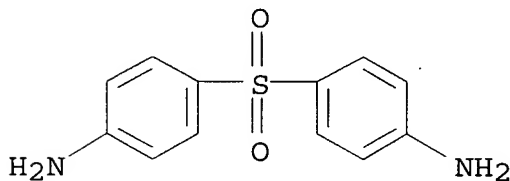
CMF C12 H12 N2 O2



CM 5

CRN 80-08-0

CMF C12 H12 N2 O2 S



- IC ICM C08L079-08  
ICS C09J179-08; H05K003-46; H05K003-38
- CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 76
- ST heat resistance adhesive low temp curable **epoxy resin polyimide**
- IT **Polyimides**, uses  
(**epoxy**, arom.; low-temp.-curable specific polyimide and thermosetting resin compns. for heat-resistant adhesives for **printed circuit boards**)
- IT Adhesives  
(heat-resistant; low-temp.-curable specific polyimide and thermosetting resin compns. for heat-resistant adhesives for **printed circuit boards**)
- IT **Printed circuit boards**  
(low-temp.-curable specific polyimide and thermosetting resin compns. for heat-resistant adhesives for **printed circuit boards**)
- IT **Epoxy resins**, uses  
(**polyimide-**, arom.; low-temp.-curable specific polyimide and thermosetting resin compns. for heat-resistant

adhesives for **printed circuit boards**

IT 488152-95-0P, 1,3-Bis(3-aminophenoxy)benzene-3,3'-dihydroxy-4,4'-diaminophenyl-4,4'-(4,4'-isopropylidenediphenoxy)bispthalic anhydride-4,4'-diaminodiphenylsulfone-triphenylolmethane triglycidyl ether copolymer 488152-96-1P 488152-97-2P  
(low-temp.-curable specific polyimide and thermosetting resin compns. for heat-resistant adhesives for **printed circuit boards**)

L90 ANSWER 4 OF 16 HCAPLUS COPYRIGHT 2003 ACS  
2003:15447 Document No. 138:81684 Laminates with smooth surface and uniform plastic insulator thickness, and thin multilayer **printed circuit boards** using them.

Shimoosako, Hiroshi; Ito, Takashi; Nishinaka, Masaru (Kanegafuchi Chemical Industry Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2003001752 A2 20030108, 12 pp. (Japanese): CODEN: JKXXAF.

APPLICATION: JP.2001-192742 20010626.

AB The laminate, which is laminated with inner circuit layers to manuf. a multilayer **printed circuit board**, comprises (A) a polymer base layer, (B) an electroconductive layer on one side, and (C) an adhesive layer on the other side, wherein the thickness of the adhesive layer is equal to or less than that of the inner circuit layer and the surface roughness of the laminate corresponding to that of the inner circuit layer after laminated is .ltoreq.2 .mu.m.

IT 481014-01-1P 481014-03-3P  
(adhesive layer; laminates with smooth surface and uniform polyimide insulator thickness for thin multilayer **printed circuit boards**)

RN 481014-01-1 HCAPLUS

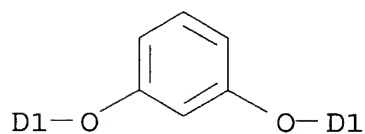
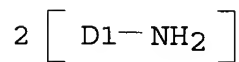
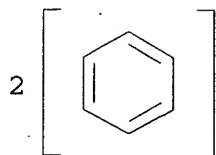
CN [5,5'-Biisobenzofuran]-1,1',3,3'-tetrone, polymer with 4,4'-diamino[1,1'-biphenyl]-3,3'-diol, 2,2',2''-[methylidynetris(phenyleneoxymethylene)]tris[oxirane], ar,ar'-[1,3-phenylenebis(oxy)]bis[benzenamine] and 4,4'-sulfonylbis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 72428-07-0

CMF C18 H16 N2 O2

CCI IDS

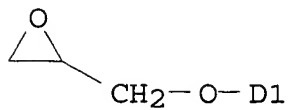
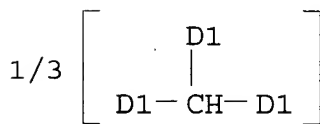
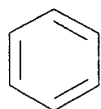


CM 2

CRN 66072-38-6

CMF C28 H28 O6

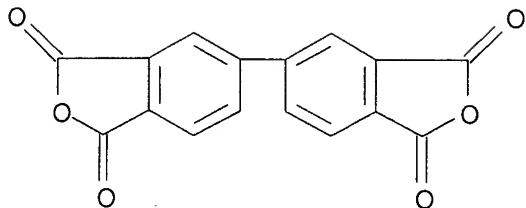
CCI IDS



CM 3

CRN 2420-87-3

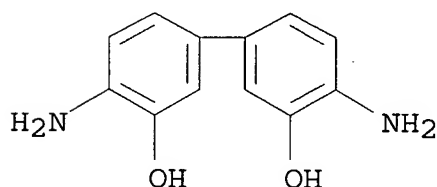
CMF C16 H6 O6



CM 4

CRN 2373-98-0

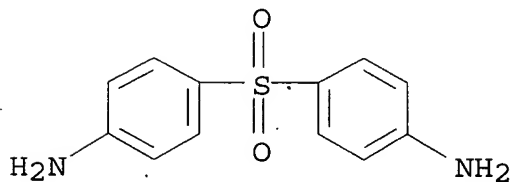
CMF C12 H12 N2 O2



CM 5

CRN 80-08-0

CMF C12 H12 N2 O2 S



RN 481014-03-3 HCAPLUS

CN [5,5'-Biisobenzofuran]-1,1',3,3'-tetrone, polymer with Adeka EPU 73, 4,4'-diamino[1,1'-biphenyl]-3,3'-diol, 2,2',2''-[methylidynetris(phenyleneoxymethylene)]tris[oxirane], ar,ar'-[1,3-phenylenebis(oxy)]bis[benzenamine] and 4,4'-sulfonylbis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

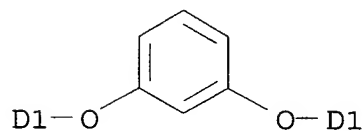
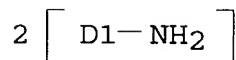
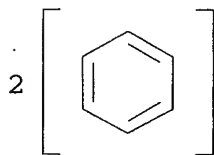
CRN 137878-94-5

CMF Unspecified  
CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

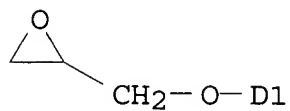
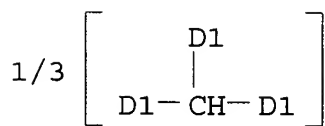
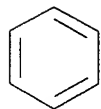
CM 2

CRN 72428-07-0  
CMF C18 H16 N2 O2  
CCI IDS



CM 3

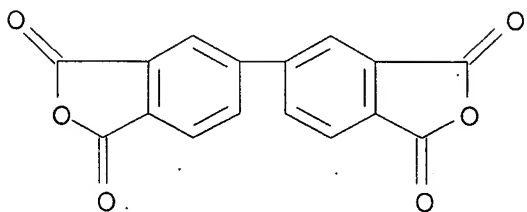
CRN 66072-38-6  
CMF C28 H28 O6  
CCI IDS



CM 4

CRN 2420-87-3

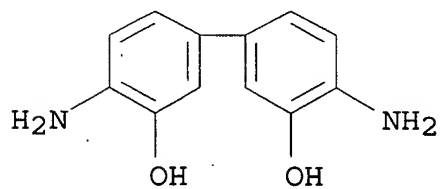
CMF C16 H6 O6



CM 5

CRN 2373-98-0

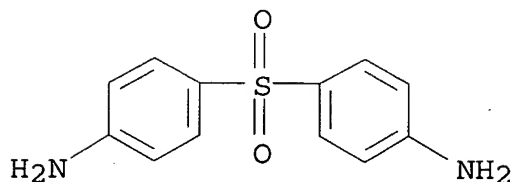
CMF C12 H12 N2 O2



CM 6

CRN 80-08-0

CMF C12 H12 N2 O2 S



IT 481013-99-4P

(laminates with smooth surface and uniform polyimide insulator thickness for thin multilayer **printed circuit boards**)

RN 481013-99-4 HCAPLUS

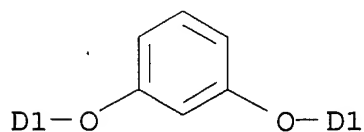
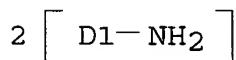
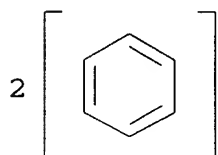
CN [5,5'-Biisobenzofuran]-1,1',3,3'-tetrone, polymer with 4,4'-diamino[1,1'-biphenyl]-3,3'-diol and ar,ar'-[1,3-phenylenebis(oxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 72428-07-0

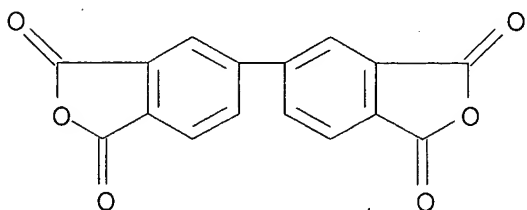
CMF C18 H16 N2 O2

CCI IDS



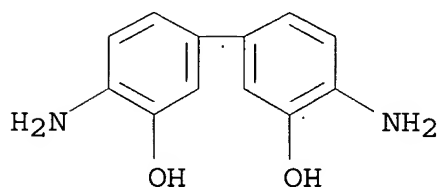
CM 2

CRN 2420-87-3  
CMF C16 H6 O6



CM 3

CRN 2373-98-0  
CMF C12 H12 N2 O2



IC ICM B32B015-08  
ICS B32B015-08; H05K003-46  
CC 76-2 (Electric Phenomena)  
Section cross-reference(s): 38  
ST laminate polymer insulator uniform thickness; multilayer  
**printed circuit board** smooth surface;  
polyimide adhesive laminate thin **circuit board**  
IT Polysulfones, uses  
(**epoxy**-polyester-polyether-**polyimide**-,  
adhesive layer; laminates with smooth surface and uniform  
polyimide insulator thickness for thin multilayer **printed**  
**circuit boards**)  
IT Polyurethanes, uses  
(**epoxy**-polyester-polyether-**polyimide**  
-polysulfone-, adhesive layer; laminates with smooth surface and  
uniform polyimide insulator thickness for thin multilayer  
**printed circuit boards**)  
IT Polysulfones, uses  
(**epoxy**-polyester-polyether-**polyimide**  
-polyurethane-, adhesive layer; laminates with smooth surface and  
uniform polyimide insulator thickness for thin multilayer  
**printed circuit boards**)  
IT Polyimides, uses



- (**epoxy**-polyester-polyether-polysulfone-, adhesive layer; laminates with smooth surface and uniform polyimide insulator thickness for thin multilayer **printed circuit boards**)
- IT **Polyimides**, uses  
(**epoxy**-polyester-polyether-polysulfone-polyurethane-, adhesive layer; laminates with smooth surface and uniform polyimide insulator thickness for thin multilayer **printed circuit boards**)
- IT Polyethers, uses  
(**epoxy**-polyester-**polyimide**-polysulfone-, adhesive layer; laminates with smooth surface and uniform polyimide insulator thickness for thin multilayer **printed circuit boards**)
- IT Polyethers, uses  
(**epoxy**-polyester-**polyimide**-polysulfone-polyurethane-, adhesive layer; laminates with smooth surface and uniform polyimide insulator thickness for thin multilayer **printed circuit boards**)
- IT Polyesters, uses  
(**epoxy**-polyether-**polyimide**-polysulfone-, adhesive layer; laminates with smooth surface and uniform polyimide insulator thickness for thin multilayer **printed circuit boards**)
- IT Polyesters, uses  
(**epoxy**-polyether-**polyimide**-polysulfone-polyurethane-, adhesive layer; laminates with smooth surface and uniform polyimide insulator thickness for thin multilayer **printed circuit boards**)
- IT Adhesives  
Electric insulators  
(laminates with smooth surface and uniform polyimide insulator thickness for thin multilayer **printed circuit boards**)
- IT Laminated plastics, uses  
(laminates with smooth surface and uniform polyimide insulator thickness for thin multilayer **printed circuit boards**)
- IT **Printed circuit boards**  
(multilayer; laminates with smooth surface and uniform polyimide insulator thickness for thin multilayer **printed circuit boards**)
- IT Polyimides, uses  
(polyester-polyether-, insulator layer; laminates with smooth surface and uniform polyimide insulator thickness for thin multilayer **printed circuit boards**)
- IT **Epoxy** resins, uses  
(polyester-polyether-polyimide-polysulfone-, adhesive layer; laminates with smooth surface and uniform polyimide insulator thickness for thin multilayer **printed circuit boards**)
- IT **Epoxy** resins, uses

(polyester-polyether-polyimide-polysulfone-polyurethane-, adhesive layer; laminates with smooth surface and uniform polyimide insulator thickness for thin multilayer **printed circuit boards**)

IT Polyethers, uses  
(polyester-polyimide-, insulator layer; laminates with smooth surface and uniform polyimide insulator thickness for thin multilayer **printed circuit boards**)

IT Polyesters, uses  
(polyether-polyimide-, insulator layer; laminates with smooth surface and uniform polyimide insulator thickness for thin multilayer **printed circuit boards**)

IT 481014-01-1P 481014-03-3P  
(adhesive layer; laminates with smooth surface and uniform polyimide insulator thickness for thin multilayer **printed circuit boards**)

IT 240128-65-8P, 4,4'-Diaminobenzanilide-4,4'-diaminodiphenyl ether-p-phenylene bis(trimellitate anhydride) copolymer  
(insulator layer; laminates with smooth surface and uniform polyimide insulator thickness for thin multilayer **printed circuit boards**)

IT 481013-99-4P  
(laminates with smooth surface and uniform polyimide insulator thickness for thin multilayer **printed circuit boards**)

L90 ANSWER 5 OF 16 HCAPLUS COPYRIGHT 2003 ACS

2002:955317 Document No. 138:48031 Adhesive composition, laminates, and multilayer **printed circuit boards** using adhesives thereof. Shimoosako, Kanji; Ito, Takashi; Nishinaka, Masaru (Kanegafuchi Chemical Industry Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002361788 A2 20021218, 12 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-171102 20010606.

AB The title laminates suitable for fabrication of the multilayer **circuit boards** comprise a polymer substrate film, a conductor layer formed on one side of the substrate film, and an adhesive layer on the other, wherein the adhesive comprises ester dianhydride-diamine **polyimide** and **epoxy** resins.

IT 478691-97-3, 1,3-Bis(diaminophenoxy)benzene-3,3'-dihydroxy-4,4'-diaminobiphenyl-2,2-bis(4-hydroxyphenyl)propanedibenzoate-3,3',4,4'-tetracarbodianhydride-Epikote 1032H60-4,4'-diaminodiphenyl sulfone copolymer  
(adhesive materials on laminated **circuit flexible board**; adhesive compn., laminates, and multilayer **printed circuit boards** using adhesives thereof)

RN 478691-97-3 HCAPLUS

CN 5-Isobenzofurancarboxylic acid, 1,3-dihydro-1,3-dioxo-, (1-methylethylidene)di-4,1-phenylene ester, polymer with 4,4'-diamino[1,1'-biphenyl]-3,3'-diol, 2,2',2''-[methylidynetris(phenyleneoxymethylene)]tris[oxirane], 4,4'-[1,3-phenylenebis(oxy)]bis[1,2-benzenediamine] and

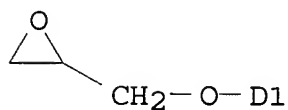
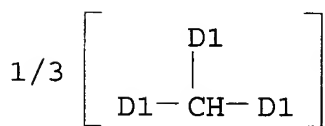
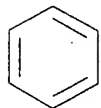
4,4'-sulfonylbis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 66072-38-6

CMF C28 H28 O6

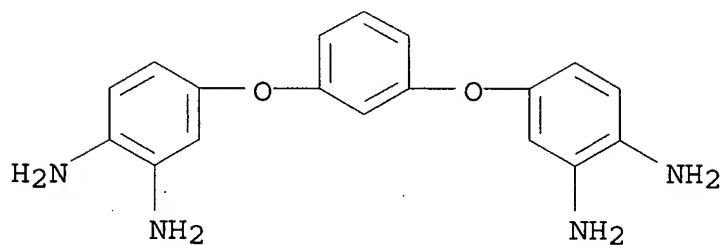
CCI IDS



CM 2

CRN 19484-27-6

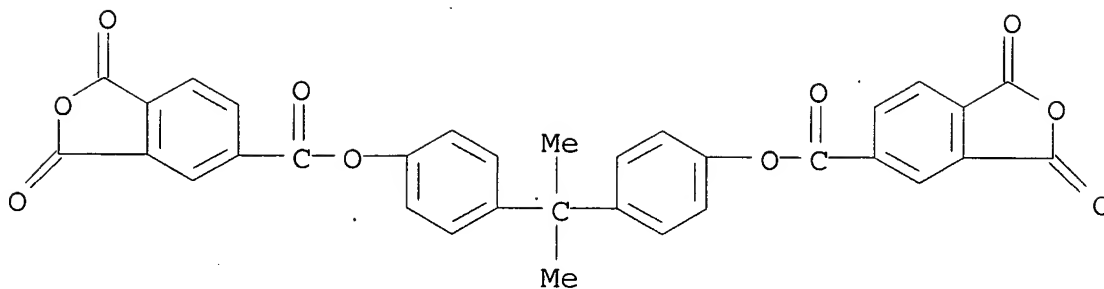
CMF C18 H18 N4 O2



CM 3

CRN 2770-50-5

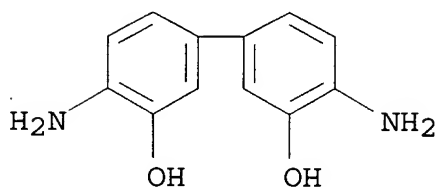
CMF C33 H20 O10



CM 4

CRN 2373-98-0

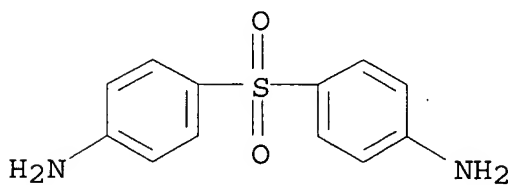
CMF C12 H12 N2 O2



CM 5

CRN 80-08-0

CMF C12 H12 N2 O2 S



IC ICM B32B015-08  
 ICS B32B015-08; C08G059-62; C08G073-10; C09J163-00; C09J179-08;  
 H05K003-46

CC 76-2 (Electric Phenomena)  
 Section cross-reference(s): 38

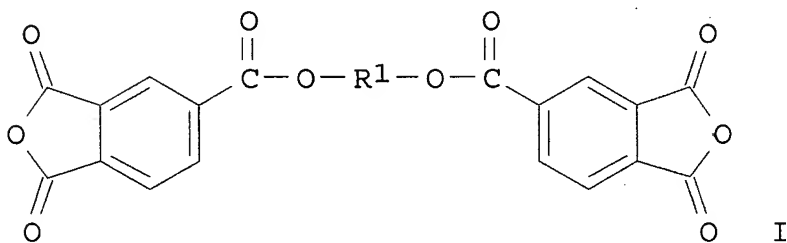
ST ester dianhydride diamine polyimide adhesive **circuit board** laminate

IT **Epoxy** resins, properties  
 (copolymer with polyimides; adhesive compn., laminates, and  
 multilayer **printed circuit boards**  
 using adhesives thereof)

- IT Polyimides, properties  
(flexible substrate; adhesive compn., laminates, and multilayer **printed circuit boards** using adhesives thereof)
- IT 478691-97-3, 1,3-Bis(diaminophenoxy)benzene-3,3'-dihydroxy-4,4'-diaminobiphenyl-2,2-bis(4-hydroxyphenyl)propanedibenzoate-3,3',4,4'-tetracarboxylic dianhydride-Epikote 1032H60-4,4'-diaminodiphenyl sulfone copolymer  
(adhesive materials on laminated **circuit** flexible **board**; adhesive compn., laminates, and multilayer **printed circuit boards** using adhesives thereof)
- IT 7440-50-8, Copper, properties  
(circuit layer film, laminated on polyimide substrate; adhesive compn., laminates, and multilayer **printed circuit boards** using adhesives thereof)
- IT 428855-68-9, Apical 12.5HP  
(polyimide substrate film; adhesive compn., laminates, and multilayer **printed circuit boards** using adhesives thereof)

L90 ANSWER 6 OF 16 HCAPLUS COPYRIGHT 2003 ACS  
2002:827499 Document No. 137:326302 Polyimide films, their manufacture, films having conductive layers, and multilayer **printed circuit boards**. Nishinaka, Masaru; Ito, Takashi; Shimoosako, Kanji (Kanegafuchi Chemical Industry Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002317046 A2 20021031, 20 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-123677 20010420.

GI



- AB The films, having humidity expansion coeff. (CHE; dimensional change per relative humidity 1%) of .ltoreq.7 ppm, contain polyimides manufd. by reaction of acid dianhydride components contg. arom. tetracarboxylic acid anhydrides I (R1 = Rz-substituted phenylene or biphenylene; Rz = H, Me, Cl, Br) with diamine components contg. p-H2NC6RmH4CONHC6RnH4NH2-p, p-H2NC6RmH4CONHC6RnH4CONHC6RmH4NH2-p, p-H2NC6RmH4CONHC6RnH4NHCOC6RmH4NH2-p, or p-H2NC6RmH4NHCOC6RnH4CONHC6RmH4NH2-p (Rm, Rn = same as Rz) and imidation. Thus, a multilayer **printed circuit**

**board** having a coated film comprising sequential layers of Cu layer, a film (CHE 2 ppm) comprising 4,4'-diaminodiphenyl ether-4,4'-diaminobenzanilide-I (Rz = H) copolymer, and an adhesive layer contg. 1,3-bis(3-aminophenoxy)benzene-3,3'-dihydroxybenzidine-2,2-bis(4-hydroxyphenyl)propane benzoate-3,3',4,4'-tetracarboxylic acid anhydride copolymer showed no warp after storage at 20.degree. and relative humidity 60% for 1 wk.

IT 473566-16-4P

(adhesive layers; polyimide films for laminates having conductive layers for multilayer **printed circuit boards**)

RN 473566-16-4 HCAPLUS

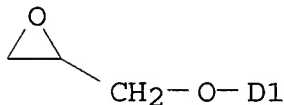
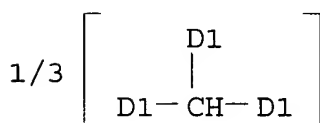
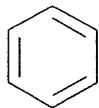
CN 5-Isobenzofurancarboxylic acid, 1,3-dihydro-1,3-dioxo-, (1-methylethylidene)di-4,1-phenylene ester, polymer with 4,4'-diamino[1,1'-biphenyl]-3,3'-diol, 2,2',2''-[methylidynetris(phenyleneoxymethylene)]tris[oxirane] and 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 66072-38-6

CMF C28 H28 O6

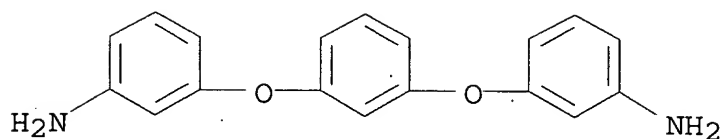
CCI IDS



CM 2

CRN 10526-07-5

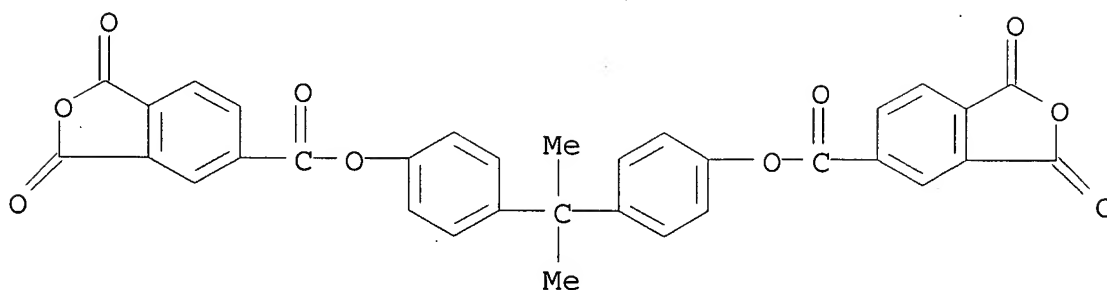
CMF C18 H16 N2 O2



CM 3

CRN 2770-50-5

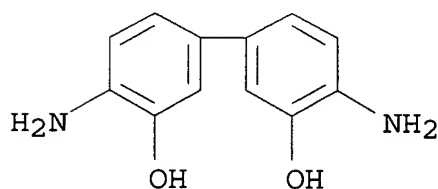
CMF C33 H20 O10



CM 4

CRN 2373-98-0

CMF C12 H12 N2 O2



IC ICM C08G073-16  
 ICS B29C041-02; B32B015-08; C08J005-18; B29K079-00; B29L007-00;  
 C08L079-08

CC 38-3 (Plastics Fabrication and Uses)  
 Section cross-reference(s): 76

ST polyimide film multilayer **printed circuit board**; moisture resistance trimellitic anhydride polyimide film; copper polyimide film **printed circuit board**; diaminobenzanilide polyimide adhesive film **printed circuit board**

IT Electric conductors  
 (copper; polyimide films for laminates having conductive layers)

- for multilayer **printed circuit boards**  
)
- IT **Polyimides**, uses  
(**epoxy**, adhesive layers; **polyimide** films for laminates having conductive layers for multilayer **printed circuit boards**)
- IT Adhesion promoters  
(manuf. of polyimide films for multilayer **printed circuit boards** by soaking in solns. of)
- IT **Printed circuit boards**  
(multilayer; polyimide films for laminates having conductive layers for multilayer **printed circuit boards**)
- IT Plastic films  
Water-resistant materials  
(polyimide films for laminates having conductive layers for multilayer **printed circuit boards**)
- IT **Polyimides**, uses  
(polyimide films for laminates having conductive layers for multilayer **printed circuit boards**)
- IT **Epoxy** resins, uses  
(**polyimide**-, adhesive layers; polyimide films for laminates having conductive layers for multilayer **printed circuit boards**)
- IT 919-30-2, .gamma.-Aminopropyltriethoxysilane 7429-90-5D, Aluminum, compds. 7439-89-6D, Iron, compds. 7439-92-1D, Lead, compds. 7439-96-5D, Manganese, compds. 7440-02-0D, Nickel, compds. 7440-05-3D, Palladium, compds. 7440-31-5D, Tin, compds. 7440-36-0D, Antimony, compds. 7440-47-3D, Chromium, compds. 7440-48-4D, Cobalt, compds. 7440-50-8D, Copper, compds. 7440-66-6D, Zinc, compds. 81307-49-5, TBSTA  
(adhesion promoters; polyimide films for laminates having conductive layers for multilayer **printed circuit boards**)
- IT **473566-16-4P**  
(adhesive layers; polyimide films for laminates having conductive layers for multilayer **printed circuit boards**)
- IT 7440-50-8, Copper, uses  
(conductive layers; polyimide films for laminates having conductive layers for multilayer **printed circuit boards**)
- IT 240128-65-8P  
(polyimide films for laminates having conductive layers for multilayer **printed circuit boards**)

L90 ANSWER 7 OF 16 HCAPLUS COPYRIGHT 2003 ACS

2002:143246 Document No. 136:185048 **Epoxy-polyimide**  
composites suitable as encapsulants. Han, Haksoo; Jang, Won Bong; Chung, Hyun Soo; Lee, Jong Hwa (S. Korea). U.S. Pat. Appl. Publ. US 2002022310 A1 20020221, 16 pp. (English). CODEN: USXXCO.  
APPLICATION: US 2001-839749 20010423. PRIORITY: KR 2000-38797



20000707.

AB This invention provides novel **epoxy-polyimide** composites and process for producing the same which has excellent thermal stability and mech. properties whereby sol. reactive polyimide contg. hydroxyl functional group were used as a curing agent. The novel **epoxy-polyimide** composites, which is polymd. by reacting **epoxy** resin and **polyimide** during curing process, can be widely used as insulating intermediate layer in **integrated circuits** and electronic circuit encapsulants. The invention also provides an **epoxy resin/polyimide** compn. comprising an **epoxy** resin and a **polyimide**.

IT 121333-85-5P, 2,2'-Bis(3-amino-4-hydroxyphenyl)-hexafluoropropane-4,4'-(hexafluoroisopropylidene) diphthalic acid dianhydride copolymer

(**epoxy-polyimide** composites suitable as encapsulants)

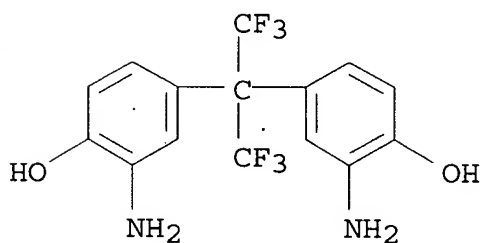
RN 121333-85-5 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis-, polymer with 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[2-aminophenol] (9CI) (CA INDEX NAME)

CM 1

CRN 83558-87-6

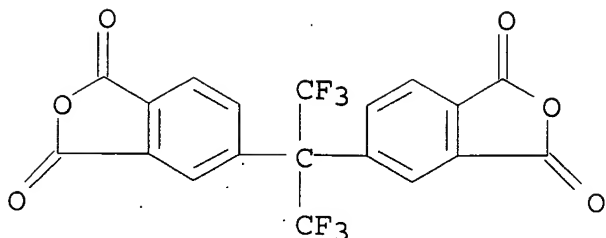
CMF C15 H12 F6 N2 O2



CM 2

CRN 1107-00-2

CMF C19 H6 F6 O6



- IC ICM H01L021-8238  
 NCL 438200000  
 CC 38-3 (Plastics Fabrication and Uses)  
 ST **epoxy polyimide** composite encapsulant heat resistance  
 IT Phenolic resins, uses  
     (**epoxy**, novolak; **epoxy-polyimide** composites suitable as encapsulants)  
 IT Electric apparatus  
     Encapsulants  
     Heat-resistant materials  
     (**epoxy-polyimide** composites suitable as encapsulants)  
 IT **Polyimides**, uses  
     (**epoxy-polyimide** composites suitable as encapsulants)  
 IT **Epoxy** resins, uses  
     (**epoxy-polyimide** composites suitable as encapsulants)  
 IT Polymer blends  
     (**epoxy-polyimide** composites suitable as encapsulants)  
 IT **Epoxy** resins, uses  
     (phenolic, novolak; **epoxy-polyimide** composites suitable as encapsulants)  
 IT **121333-85-5P**, 2,2'-Bis(3-amino-4-hydroxyphenyl)-hexafluoropropane-4,4'-(hexafluoroisopropylidene) diphthalic acid dianhydride copolymer 121334-09-6P 122983-64-6P  
     (**epoxy-polyimide** composites suitable as encapsulants)  
 IT 85954-11-6  
     (**epoxy-polyimide** composites suitable as encapsulants)

L90 ANSWER 8 OF 16 HCAPLUS COPYRIGHT 2003 ACS  
 2002:36584 Document No. 136:86646 Polyimide-siloxanes with reduced cyclic siloxane oligomers, their manufacture, and their compositions with improved adhesion. Sugeo, Michihiro; Kato, Hideto (Shin-Etsu Chemical Industry Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002012666 A2 20020115, 9 pp. (Japanese). CODEN: JKXXAF.  
 APPLICATION: JP 2000-196842 20000629.

AB The polyimide-siloxanes, useful for **printed circuit boards**, heat-resistant adhesive tapes, etc., show cyclic siloxane oligomer (Si no. .ltoreq.10) content .ltoreq.300 ppm, Tg .ltoreq.250.degree., and soly. in org. solvents. The compns. comprise 50-99% polyimide-siloxanes and 1-50% **epoxy** compds. Thus, polymn. of 3,3',4,4'-diphenylsulfonetetracarboxylic dianhydride, 3-aminopropyl-terminated poly(dimethylsiloxane), 3,3'-dihydroxy-4,4'-diaminobiphenyl, and 2,2-bis[4-(4-aminophenoxy)phenyl]propane gave a copolymer, which was purified to cyclic oligomer content 80 ppm, mixed with an **epoxy** resin (Epikote 825), 2-butanone, and 2-ethylimidazole to give an adhesive showing tensile shear adhesive strength to Cu and Al 3.8 and 4.2 MPa, resp.

IT 211686-99-6 386701-89-9

(manuf. of polyimide-siloxanes with reduced cyclic siloxane oligomer content for heat-resistant adhesives)

RN 211686-99-6 HCAPLUS

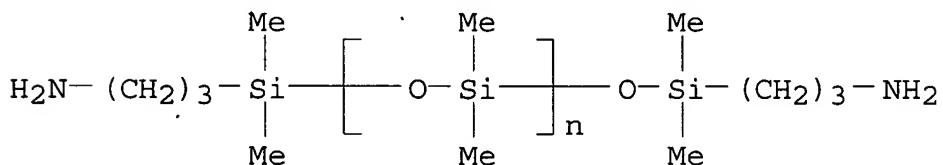
CN 1,3-Isobenzofurandione, 5,5'-sulfonylbis-, polymer with .alpha.-[(3-aminopropyl)dimethylsilyl]-.omega.-[[[(3-aminopropyl)dimethylsilyl]oxy]poly[oxy(dimethylsilylene)]], 4,4'-diamino[1,1'-biphenyl]-3,3'-diol and 4,4'-[(1-methylethylidene)bis(4,1-phenyleneoxy)]bis[benzenamine], block (9CI) (CA INDEX NAME)

CM 1

CRN 97917-34-5

CMF (C2 H6 O, Si)n C10 H28 N2 O Si2

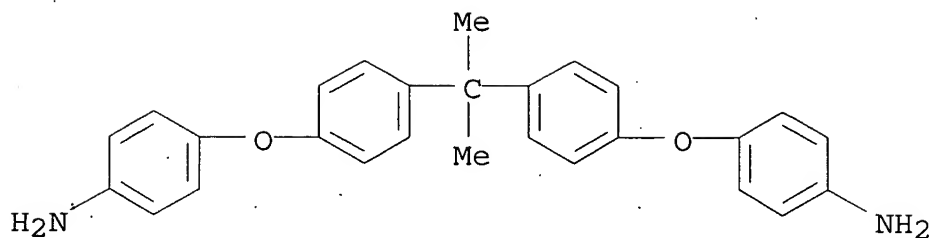
CCI PMS



CM 2

CRN 13080-86-9

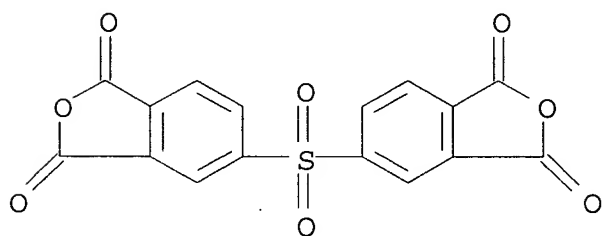
CMF C27 H26 N2 O2



CM 3

CRN 2540-99-0

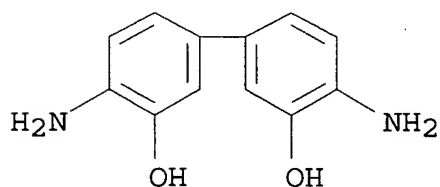
CMF C16 H6 O8 S



CM 4

CRN 2373-98-0

CMF C12 H12 N2 O2



RN 386701-89-9 HCAPLUS

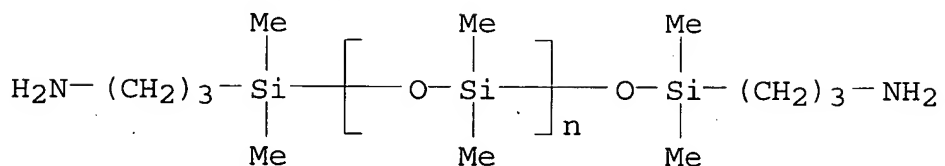
CN 1,3-Isobenzofurandione, 5,5'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis-, polymer with .alpha.-[(3-aminopropyl)dimethylsilyl]-.omega.-[[[(3-aminopropyl)dimethylsilyl]oxy]poly[oxy(dimethylsilylene)]], 4,4'-diamino[1,1'-biphenyl]-3,3'-diol, 4,4'-[(1-methylethylidene)bis(4,1-phenyleneoxy)]bis[benzenamine] and 3,3'-(1,1,3,3-tetramethyl-1,3-disiloxanediyl)bis[1-propanamine], block (9CI). (CA INDEX NAME)

CM 1

CRN 97917-34-5

CMF (C2 H6 O Si)<sub>n</sub> C10 H28 N2 O Si2

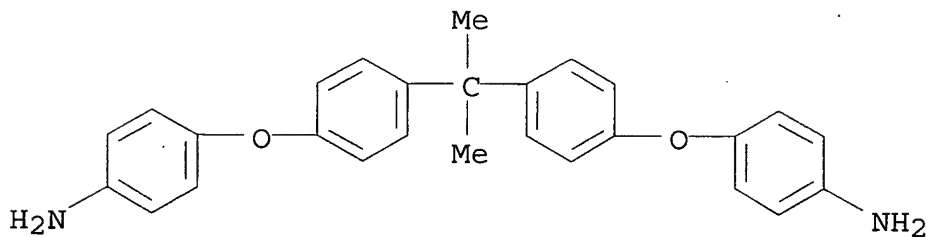
CCI PMS



CM 2

CRN 13080-86-9

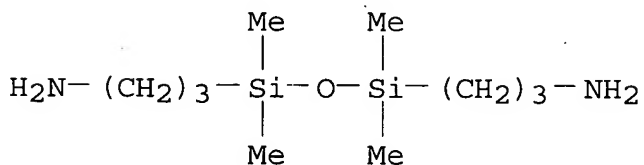
CMF C27 H26 N2 O2



CM 3

CRN 2469-55-8

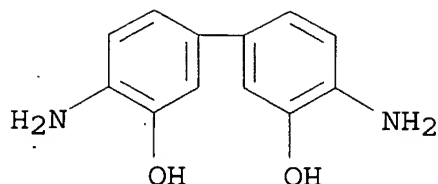
CMF C10 H28 N2 O Si2



CM 4

CRN 2373-98-0

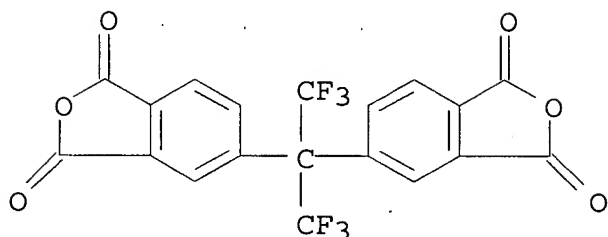
CMF C12 H12 N2 O2



CM 5

CRN 1107-00-2

CMF C19 H6 F6 O6

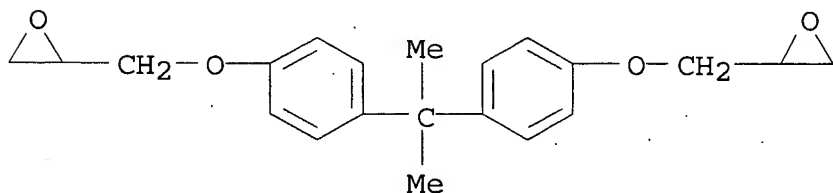


IT 25085-99-8, Epikote 825 84778-06-3, Epikote 152  
 (manuf. of polyimide-siloxanes with reduced cyclic siloxane  
 oligomer content for heat-resistant adhesives)  
 RN 25085-99-8 HCAPLUS  
 CN Oxirane, 2,2'-[(1-methylethylidene)bis(4,1-  
 phenyleneoxymethylene)]bis-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1675-54-3

CMF C21 H24 O4

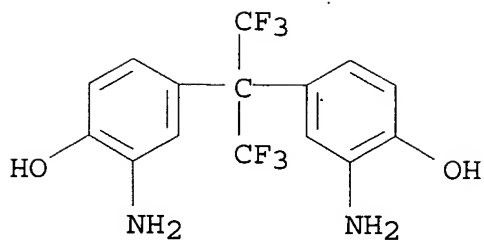


RN 84778-06-3 HCAPLUS  
 CN Epikote 152 (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

IC ICM C08G077-455

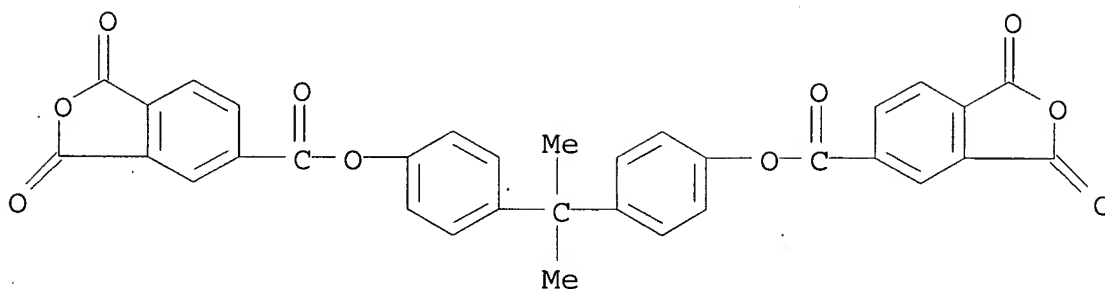
- ICS C08G073-10; C08L063-00; C08L083-10  
CC 37-3 (Plastics Manufacture and Processing)  
Section cross-reference(s): 76  
ST **polyimide** siloxane **epoxy** resin heat resistant  
adhesive; phenylsulfonetetracarboxylic aminopropyl methylsiloxane  
hydroxyaminobiphenyl aminophenoxyphenylpropane polyimide silicone  
IT **Epoxy** resins, properties  
(manuf. of polyimide-siloxanes with reduced cyclic siloxane  
oligomer content for heat-resistant adhesives)  
IT 211686-99-6 386701-89-9  
(manuf. of polyimide-siloxanes with reduced cyclic siloxane  
oligomer content for heat-resistant adhesives)  
IT 25085-99-8, Epikote 825 84778-06-3, Epikote 152  
386736-70-5, Epikote 801P  
(manuf. of polyimide-siloxanes with reduced cyclic siloxane  
oligomer content for heat-resistant adhesives)  
L90 ANSWER 9 OF 16 HCAPLUS COPYRIGHT 2003 ACS  
2002:21700 Document No. 136:94479 Photosensitive polyimide  
compositions and coverlay films manufactured from them with  
excellent adhesion and heat and moisture resistance. Okada,  
Yoshifumi; Hara, Masayuki; Nojiri, Hitoshi (Kanegafuchi Chemical  
Industry Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002003715 A2  
20020109, 18 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP  
2000-191757 20000626.  
AB The compns. contain org. solvent-sol. polyimides (A) having OH  
and/or CO<sub>2</sub>H groups on benzene rings, compds. (B) having .gtoreq.2  
C-C double bonds, and compds. (C) having .gtoreq.2 **epoxy**  
groups. The compns. may contain 0.1-50 parts (on 100 parts the  
polyimides) photoinitiators and/or sensitizers. The compns. give  
coverlay films for flexible **printed circuit**  
**boards**. with good interlayer adhesion.  
IT 293728-10-6P, 2,2-Bis(3-amino-4-  
hydroxyphenyl)hexafluoropropane-2,2-bis(4-hydroxyphenyl)propane  
dibenzoate-3,3',4,4'-tetracarboxylic dianhydride copolymer  
372111-15-4P, Bis[4-(3-aminophenoxy)phenyl]  
sulfone-2,2-bis(4-hydroxyphenyl)propane dibenzoate-3,3',4,4'-  
tetracarboxylic dianhydride-4,4'-diamino-3,3'-dihydroxybiphenyl  
copolymer  
(photocurable polyimide compns. for coverlay films with good  
adhesion to Cu and heat and moisture resistance)  
RN 293728-10-6 HCAPLUS  
CN 5-Isobenzofurancarboxylic acid, 1,3-dihydro-1,3-dioxo-,  
(1-methylethylidene)di-4,1-phenylene ester, polymer with  
4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[2-  
aminophenol] (9CI) (CA INDEX NAME)  
CM 1  
CRN 83558-87-6  
CMF C15 H12 F6 N2 O2



CM 2

CRN 2770-50-5

CMF C33 H20 O10



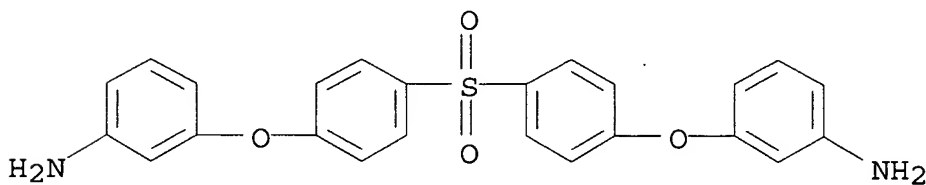
RN 372111-15-4 HCAPLUS

CN 5-Isobenzofurancarboxylic acid, 1,3-dihydro-1,3-dioxo-,  
(1-methylethylidene)di-4,1-phenylene ester, polymer with  
4,4'-diamino[1,1'-biphenyl]-3,3'-diol and 3,3'-[sulfonylbis(4,1-  
phenyleneoxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 30203-11-3

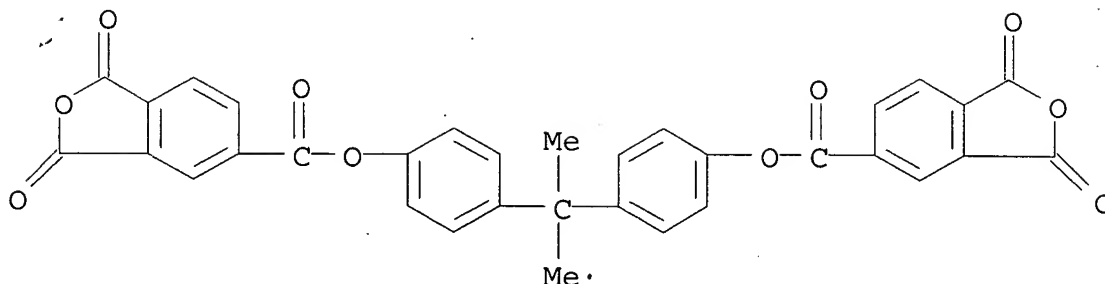
CMF C24 H20 N2 O4 S



CM 2

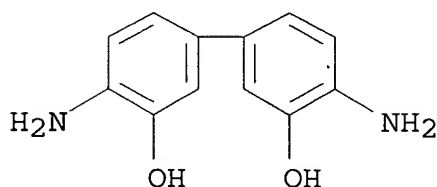


CRN 2770-50-5  
CMF C33 H20 O10



CM 3

CRN 2373-98-0  
CMF C12 H12 N2 O2



IT **385805-88-9P**, 2,2-Bis(3-amino-4-hydroxyphenyl)hexafluoropropane-2,2-bis(4-hydroxyphenyl)propane dibenzoate-3,3',4,4'-tetracarboxylic dianhydride-4,4'-diaminodiphenyl sulfone-Epikote 828-isocyanuric acid ethylene oxide adduct triacrylate copolymer copolymer (photocurable polyimide compns. for coverlay films with good adhesion to Cu and heat and moisture resistance)

RN 385805-88-9 HCAPLUS

CN 5-Isobenzofurancarboxylic acid, 1,3-dihydro-1,3-dioxo-, (1-methylethylidene)di-4,1-phenylene ester, polymer with (chloromethyl)oxirane, 4,4'-(1-methylethylidene)bis[phenol], 4,4'-sulfonylbis[benzenamine], 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[2-aminophenol] and .alpha.,.alpha.',.alpha.''-[(2,4,6-trioxo-1,3,5-triazine-1,3,5(2H,4H,6H)-triyl)tri-2,1-ethanediyl]tris[.omega.-[(1-oxo-2-propenyl)oxy]poly(oxy-1,2-ethanediyl)] (9CI) (CA INDEX NAME)

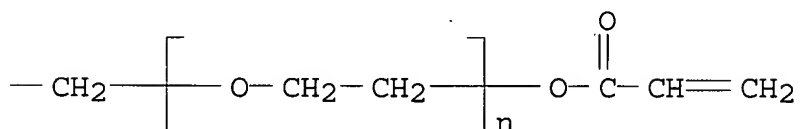
CM 1

CRN 100844-79-9  
CMF (C2 H4 O)n (C2 H4 O)n (C2 H4 O)n C18 H21 N3 O9  
CCI PMS

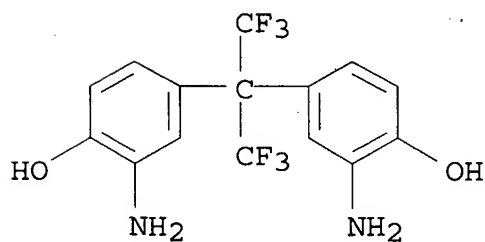
$$\text{H}_2\text{C}=\text{CH}-\overset{\overset{\text{O}}{\parallel}}{\text{C}}-\text{O}-\left[\text{CH}_2-\text{CH}_2-\text{O}\right]_n-\text{CH}_2-\text{CH}_2-$$

|

The diagram shows a chemical structure where a polymer chain segment, represented by a horizontal line ending in brackets, is connected via a methylene group (-CH2-) to one of the nitrogen atoms of a six-membered urea ring. The urea ring consists of two carbonyl groups (=O) and two nitrogen atoms. The other nitrogen atom is also bonded to a methylene group (-CH2-), which is further connected to another polymer chain segment, represented by a horizontal line starting from a bracket.

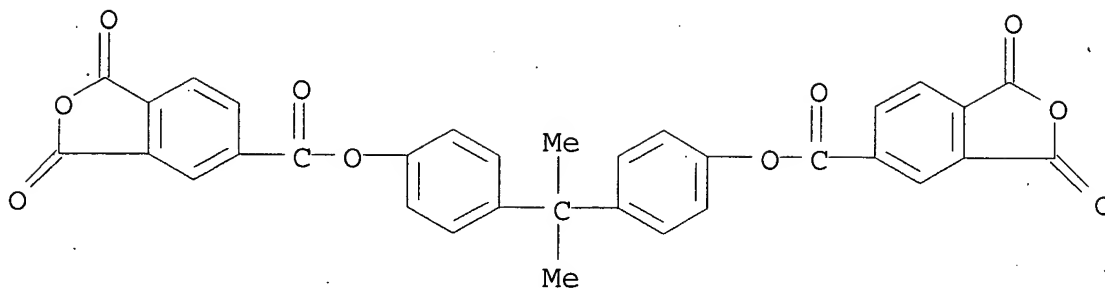
$$\text{---O---CH}_2\text{---CH}_2\text{---}\left[ \text{---O---C(=O)---CH=CH}_2 \right]_n$$


CMF C15 H12 F6 N2 O2



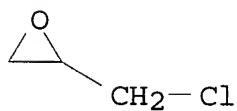
CM 3

CRN 2770-50-5  
CMF C33 H20 O10



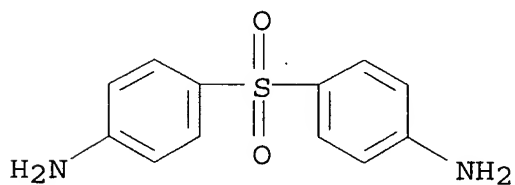
CM 4

CRN 106-89-8  
CMF C3 H5 Cl O



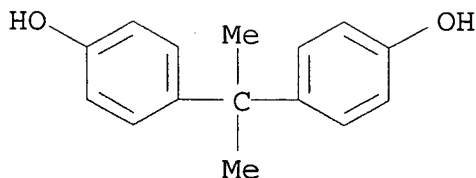
CM 5

CRN 80-08-0  
CMF C12 H12 N2 O2 S



CM 6

CRN 80-05-7  
CMF C15 H16 O2



IT 385805-85-6P, Bis[4-(3-aminophenoxy)phenyl] sulfone-2,2-bis(4-hydroxyphenyl)propane dibenzoate-3,3',4,4'-tetracarboxylic dianhydride-diaminobenzoic acid-4,4'-diaminodiphenyl sulfone-Epikote 828-isocyanuric acid ethylene oxide adduct triacrylate copolymer 385805-86-7P, Bis[4-(3-aminophenoxy)phenyl] sulfone-2,2-bis(4-hydroxyphenyl)propane dibenzoate-3,3',4,4'-tetracarboxylic dianhydride-4,4'-diamino-3,3'-dihydroxybiphenyl-4,4'-diaminodiphenyl sulfone-Epikote 828-isocyanuric acid ethylene oxide adduct triacrylate copolymer 385805-89-0P, Aronix M 208-bis[4-(3-aminophenoxy)phenyl] sulfone-2,2-bis(4-hydroxyphenyl)propane dibenzoate-3,3',4,4'-tetracarboxylic dianhydride-4,4'-diamino-3,3'-dihydroxybiphenyl-4,4'-diaminodiphenyl sulfone-Epikote 828-isocyanuric acid ethylene oxide adduct triacrylate copolymer

(photosensitive polyimide compns. for coverlay films with good adhesion to Cu and heat and moisture resistance)

RN 385805-85-6 HCAPLUS

CN 5-Isobenzofurancarboxylic acid, 1,3-dihydro-1,3-dioxo-, (1-methylethylidene)di-4,1-phenylene ester, polymer with (chloromethyl)oxirane, diaminobenzoic acid, 4,4'-(1-methylethylidene)bis[phenol], 4,4'-sulfonylbis[benzenamine], 3,3'-[sulfonylbis(4,1-phenyleneoxy)]bis[benzenamine] and .alpha.,.alpha.',.alpha.''-[(2,4,6-trioxo-1,3,5-triazine-1,3,5(2H,4H,6H)-triyl)tri-2,1-ethanediyl]tris[.omega.-[(1-oxo-2-propenyl)oxy]poly(oxy-1,2-ethanediyl)] (9CI) (CA INDEX NAME)

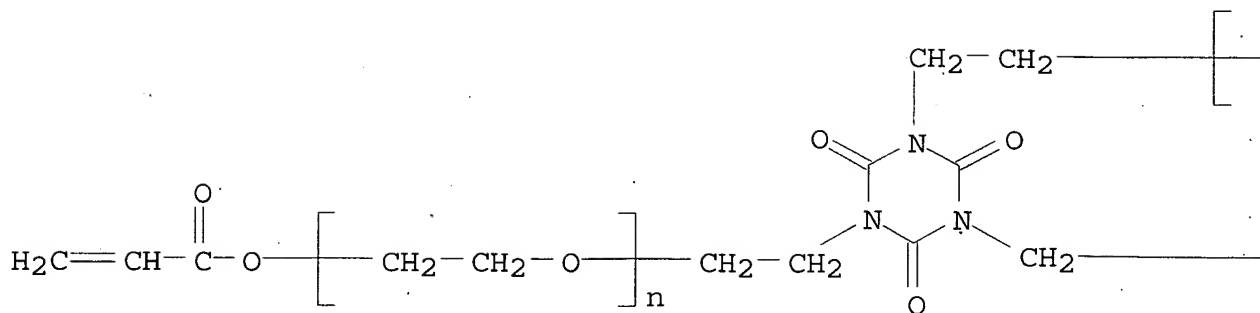
CM 1

CRN 100844-79-9

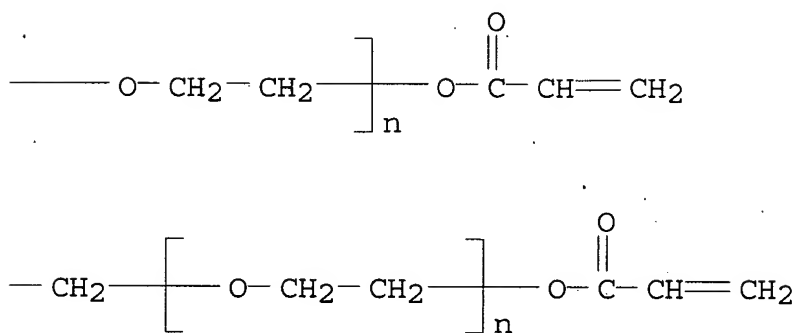
CMF (C2 H4 O)n (C2 H4 O)n (C2 H4 O)n C18 H21 N3 O9

CCI PMS

PAGE 1-A



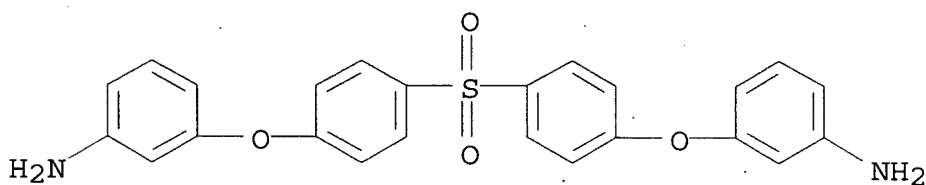
PAGE 1-B



CM 2

CRN 30203-11-3

CMF C24 H20 N2 O4 S

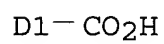
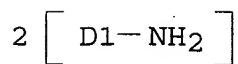
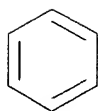


CM 3

CRN 27576-04-1

CMF C7 H8 N2 O2

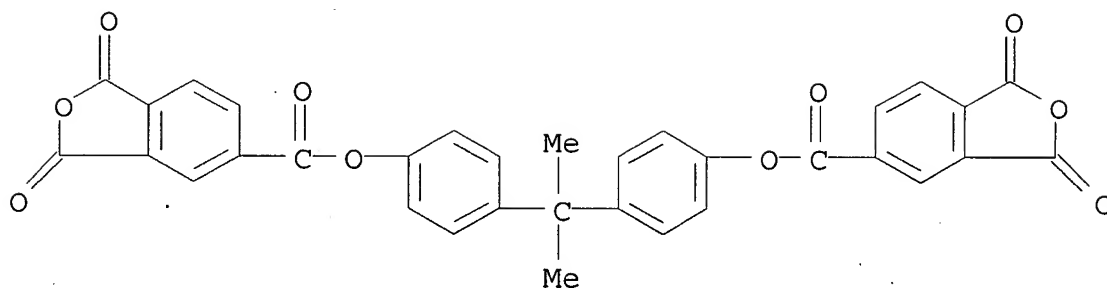
CCI IDS



CM 4

CRN 2770-50-5

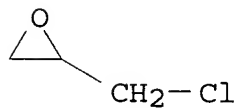
CMF C33 H20 O10



CM 5

CRN 106-89-8

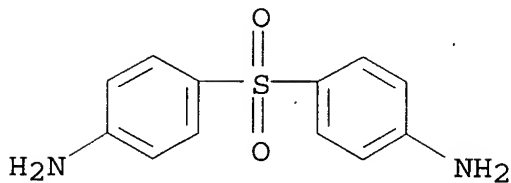
CMF C3 H5 Cl O



CM 6

CRN 80-08-0

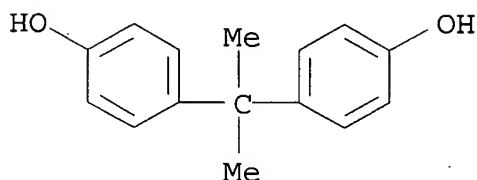
CMF C12 H12 N2 O2 S



CM 7

CRN 80-05-7

CMF C15 H16 O2



RN 385805-86-7 HCAPLUS

CN 5-Isobenzofurancarboxylic acid, 1,3-dihydro-1,3-dioxo-,  
 (1-methylethylidene)di-4,1-phenylene ester, polymer with  
 (chloromethyl)oxirane, 4,4'-diamino[1,1'-biphenyl]-3,3'-diol,  
 4,4'-(1-methylethylidene)bis[phenol], 4,4'-sulfonylbis[benzenamine],  
 3,3'-[sulfonylbis(4,1-phenyleneoxy)]bis[benzenamine] and  
 .alpha.,.alpha.',.alpha.''-[(2,4,6-trioxo-1,3,5-triazine-  
 1,3,5(2H,4H,6H)-triyl)tri-2,1-ethanediyl]tris[.omega.-[(1-oxo-2-  
 propenyl)oxy]poly(oxy-1,2-ethanediyl)] (9CI) (CA INDEX NAME)

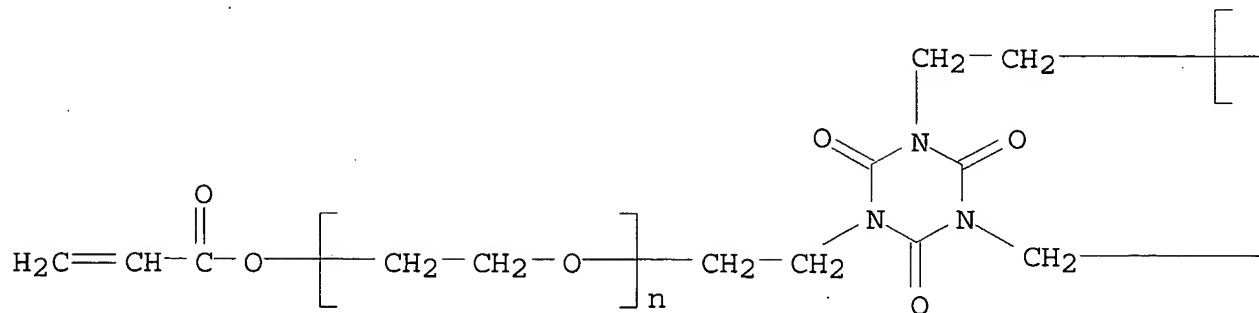
CM 1

CRN 100844-79-9

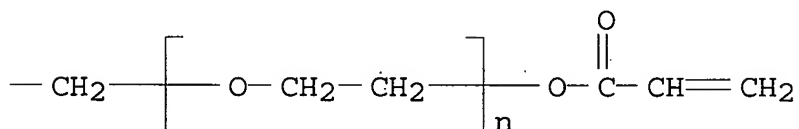
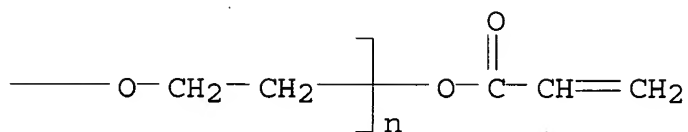
CMF (C2 H4 O)n (C2 H4 O)n (C2 H4 O)n C18 H21 N3 O9

CCI PMS

PAGE 1-A



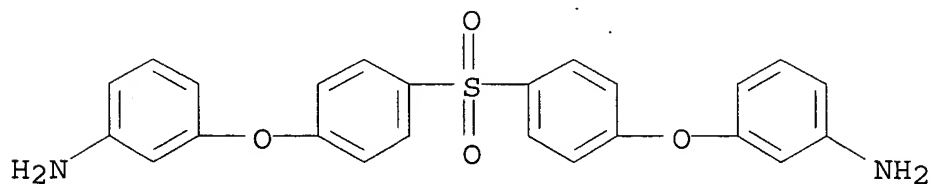
PAGE 1-B



CM 2

CRN 30203-11-3

CMF C24 H20 N2 O4 S

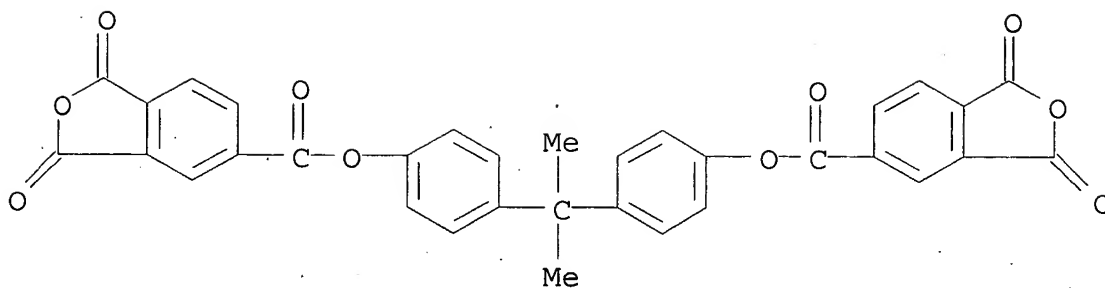


CM 3

CRN 2770-50-5

CMF C33 H20 O10

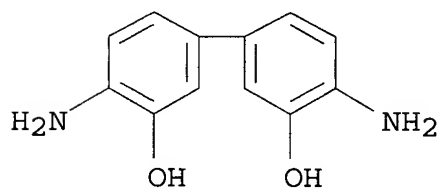




CM 4

CRN 2373-98-0

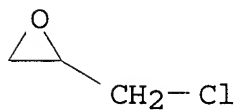
CMF C12 H12 N2 O2



CM 5

CRN 106-89-8

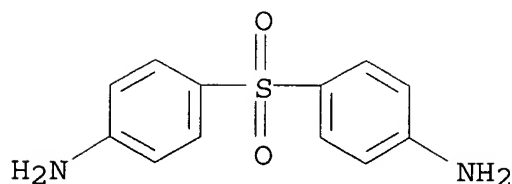
CMF C3 H5 Cl O



CM 6

CRN 80-08-0

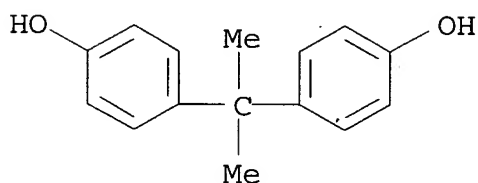
CMF C12 H12 N2 O2 S



CM 7

CRN 80-05-7

CMF C15 H16 O2



RN 385805-89-0 HCAPLUS

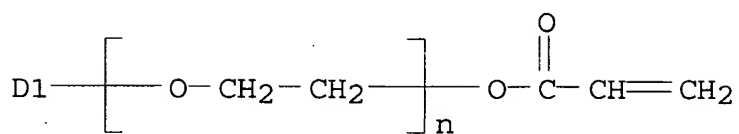
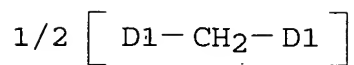
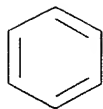
CN 5-Isobenzofurancarboxylic acid, 1,3-dihydro-1,3-dioxo-, (1-methylethylidene)di-4,1-phenylene ester, polymer with (chloromethyl)oxirane, 4,4'-diamino[1,1'-biphenyl]-3,3'-diol, .alpha.,.alpha.'-(methylenediphenylene)bis[.omega.-[(1-oxo-2-propenyl)oxyl]poly(oxy-1,2-ethanediyl)], 4,4'-(1-methylethylidene)bis[phenol], 4,4'-sulfonylbis[benzenamine], 3,3'-[sulfonylbis(4,1-phenyleneoxy)]bis[benzenamine] and .alpha.,.alpha.',.alpha.''-[(2,4,6-trioxo-1,3,5-triazine-1,3,5(2H,4H,6H)-triyl)tri-2,1-ethanediyl]tris[.omega.-[(1-oxo-2-propenyl)oxyl]poly(oxy-1,2-ethanediyl)] (9CI) (CA INDEX NAME)

CM 1

CRN 105809-30-1

CMF (C2 H4 O)n (C2 H4 O)n C19 H16 O4

CCI IDS, PMS



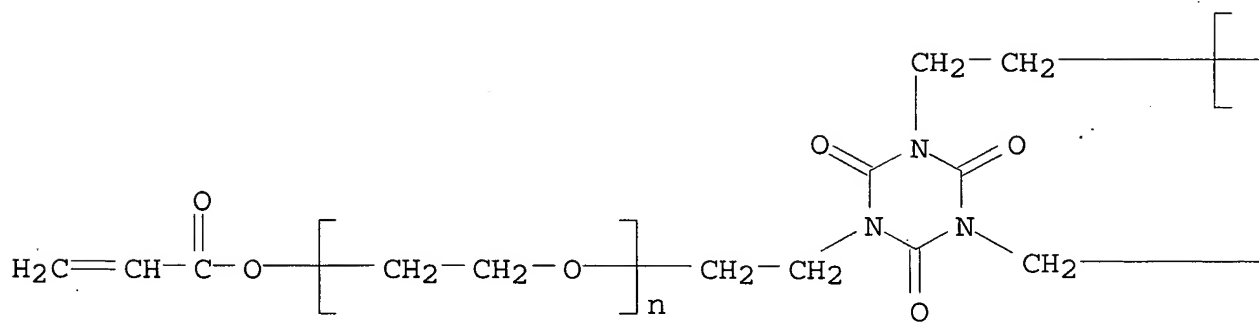
CM 2

CRN 100844-79-9

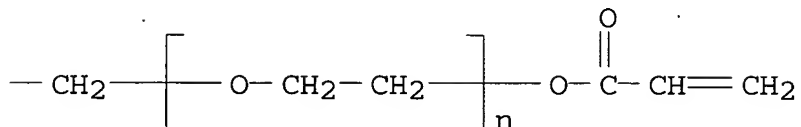
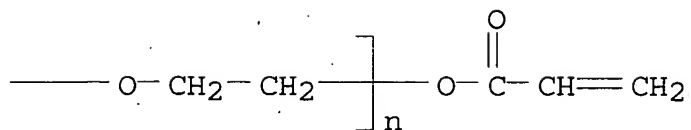
CMF (C2 H4 O)<sub>n</sub> (C2 H4 O)<sub>n</sub> (C2 H4 O)<sub>n</sub> C18 H21 N3 O9

CCI PMS

PAGE 1-A



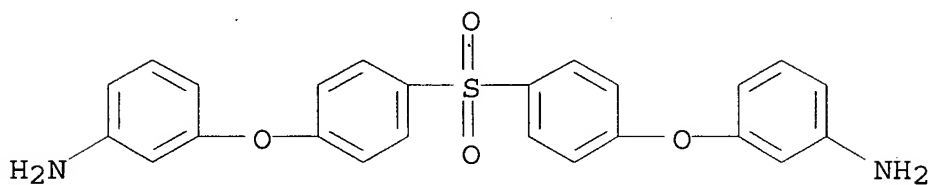
PAGE 1-B



CM 3

CRN 30203-11-3

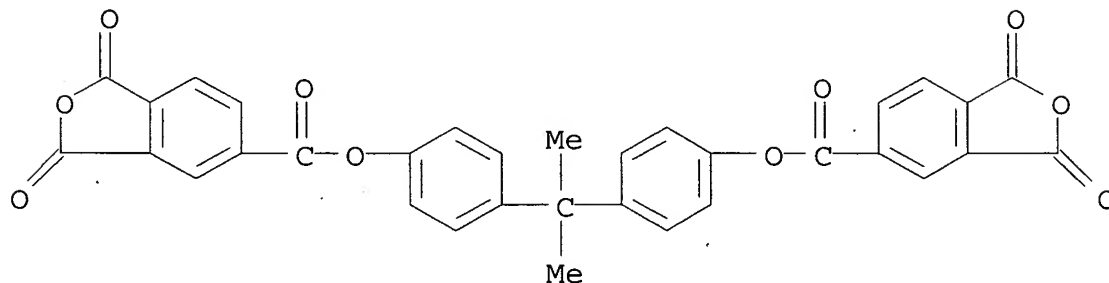
CMF C24 H20 N2 O4 S



CM 4

CRN 2770-50-5

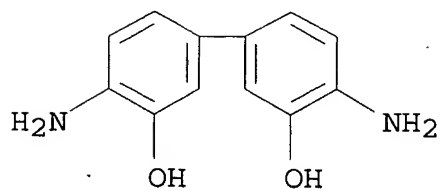
CMF C33 H20 O10



CM 5

CRN 2373-98-0

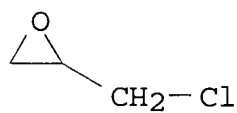
CMF C12 H12 N2 O2



CM 6

CRN 106-89-8

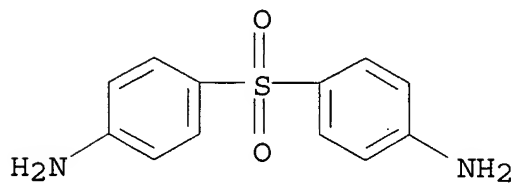
CMF C3 H5 Cl O



CM 7

CRN 80-08-0

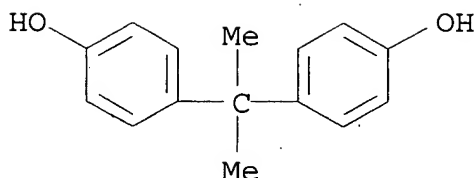
CMF C12 H12 N2 O2 S



CM 8

CRN 80-05-7

CMF C15 H16 O2



- IC ICM C08L079-08  
ICS C08F002-44; C08F002-50; C08G059-22; C08G073-10; C08J005-18;  
C08K005-00; C08L063-00; G03F007-027; G03F007-037; H05K003-28
- CC 76-3 (Electric Phenomena)  
Section cross-reference(s): 38
- ST photosensitive polyimide dry film adhesion copper; moisture  
resistance flexible **printed circuit**  
**board**; photocuring hydroxy **polyimide epoxy**  
coverlay film
- IT **Printed circuit boards**  
(flexible, cover layer films for; photosensitive polyimide  
compns. for coverlay films with good adhesion to Cu and heat and  
moisture resistance)
- IT Polysulfones, uses  
(polyether-polyimide-, reaction products with acrylate and  
**epoxy resin**; photocurable **polyimide** compns. for  
coverlay films with good adhesion to Cu and heat and moisture  
resistance)
- IT Polyimides, uses  
(polyether-polysulfone-, reaction products with acrylate and  
**epoxy resin**; photocurable **polyimide** compns. for  
coverlay films with good adhesion to Cu and heat and moisture  
resistance)
- IT Polyethers, uses  
(polyimide-polysulfone-, reaction products with acrylate and  
**epoxy resin**; photocurable **polyimide** compns. for  
coverlay films with good adhesion to Cu and heat and moisture  
resistance)
- IT **293728-10-6P**, 2,2-Bis(3-amino-4-  
hydroxyphenyl)hexafluoropropane-2,2-bis(4-hydroxyphenyl)propane  
dibenzoate-3,3',4,4'-tetracarboxylic dianhydride copolymer  
**372111-14-3P**, Bis[4-(3-aminophenoxy)phenyl] sulfone-2,2-bis(4-  
hydroxyphenyl)propane dibenzoate-3,3',4,4'-tetracarboxylic  
dianhydride-diaminobenzoic acid copolymer **372111-15-4P**,  
Bis[4-(3-aminophenoxy)phenyl] sulfone-2,2-bis(4-  
hydroxyphenyl)propane dibenzoate-3,3',4,4'-tetracarboxylic  
dianhydride-4,4'-diamino-3,3'-dihydroxybiphenyl copolymer  
**385805-87-8P** **387821-28-5P**  
(photocurable polyimide compns. for coverlay films with good  
adhesion to Cu and heat and moisture resistance)
- IT **385805-88-9P**, 2,2-Bis(3-amino-4-  
hydroxyphenyl)hexafluoropropane-2,2-bis(4-hydroxyphenyl)propane  
dibenzoate-3,3',4,4'-tetracarboxylic dianhydride-4,4'-

diaminodiphenyl sulfone-Epikote 828-isocyanuric acid ethylene oxide adduct triacrylate copolymer copolymer

(photocurable polyimide compns. for coverlay films with good adhesion to Cu and heat and moisture resistance)

- IT **385805-85-6P**, Bis[4-(3-aminophenoxy)phenyl] sulfone-2,2-bis(4-hydroxyphenyl)propane dibenzoate-3,3',4,4'-tetracarboxylic dianhydride-diaminobenzoic acid-4,4'-diaminodiphenyl sulfone-Epikote 828-isocyanuric acid ethylene oxide adduct triacrylate copolymer **385805-86-7P**, Bis[4-(3-aminophenoxy)phenyl] sulfone-2,2-bis(4-hydroxyphenyl)propane dibenzoate-3,3',4,4'-tetracarboxylic dianhydride-4,4'-diamino-3,3'-dihydroxybiphenyl-4,4'-diaminodiphenyl sulfone-Epikote 828-isocyanuric acid ethylene oxide adduct triacrylate copolymer **385805-89-0P**, Aronix M 208-bis[4-(3-aminophenoxy)phenyl] sulfone-2,2-bis(4-hydroxyphenyl)propane dibenzoate-3,3',4,4'-tetracarboxylic dianhydride-4,4'-diamino-3,3'-dihydroxybiphenyl-4,4'-diaminodiphenyl sulfone-Epikote 828-isocyanuric acid ethylene oxide adduct triacrylate copolymer (photosensitive polyimide compns. for coverlay films with good adhesion to Cu and heat and moisture resistance)

L90 ANSWER 10 OF 16 HCAPLUS COPYRIGHT 2003 ACS

2001:814154 Document No. 135:358846 Heat-resistant polyimide-based adhesive compositions. Okada, Yoshifumi; Hara, Masayuki; Nojiri, Hitoshi (Kanegafuchi Chemical Industry Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2001311055 A2 20011109, 12 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-130552 20000428.

- AB The title compns., useful for flexible **printed circuit boards**, tapes for tape automated bondings, laminates, etc. (no data), comprise (a) sol. polyimides [e.g., bis[4-(3-aminophenoxy)phenyl]sulfone-2,2-bis(4-hydroxyphenyl)propane dibenzoate-3,3',4,4'-tetracarboxylic dianhydride-diaminobenzoic acid copolymer, bis[4-(3-aminophenoxy)phenyl]sulfone-2,2-bis(4-hydroxyphenyl)propane dibenzoate-3,3',4,4'-tetracarboxylic dianhydride-3,3'-dihydroxy-4,4'-diaminobiphenyl-silicon diamine copolymer] 100, (b) **epoxy** compds. (e.g., Epikote 828, glycidyl methacrylate) 1-100, and (c) compds. having .gtoreq.2 unsatd. double bonds [e.g., isocyanuric acid tris(ethaneacrylate)] 1-150 parts.

- IT **25068-38-6**, Epikote 828 **372111-15-4D**, polymer with diamino polysiloxanes (heat-resistant polyimide-based adhesive compns.)

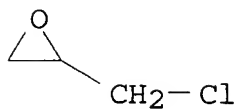
RN **25068-38-6** HCAPLUS

CN Phenol, 4,4'-(1-methylethylidene)bis-, polymer with (chloromethyl)oxirane (9CI) (CA INDEX NAME)

CM 1

CRN 106-89-8

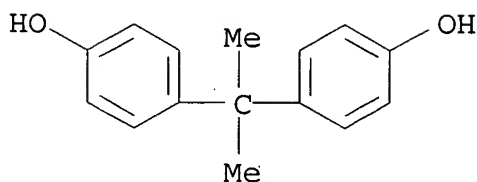
CMF C3 H5 Cl O



CM 2

CRN 80-05-7

CMF C15 H16 O2



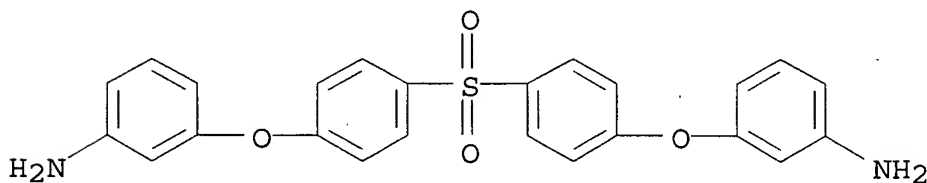
RN 372111-15-4 HCAPLUS

CN 5-Isobenzofurancarboxylic acid, 1,3-dihydro-1,3-dioxo-,  
(1-methylethylidene)di-4,1-phenylene ester, polymer with  
4,4'-diamino[1,1'-biphenyl]-3,3'-diol and 3,3'-[sulfonylbis(4,1-  
phenyleneoxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 30203-11-3

CMF C24 H20 N2 O4 S

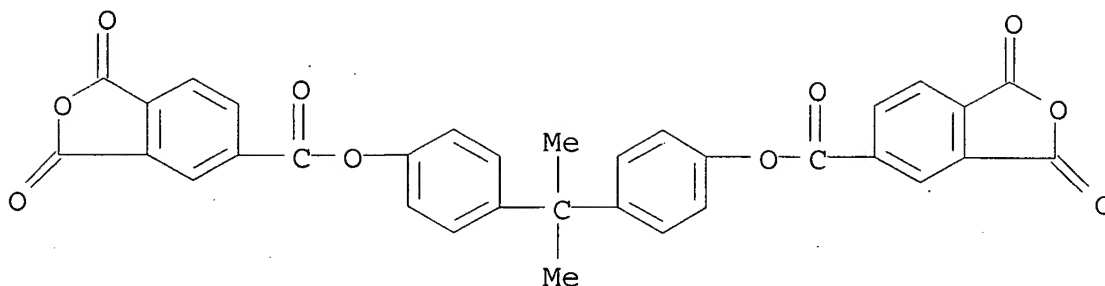


CM 2

CRN 2770-50-5

CMF C33 H20 O10

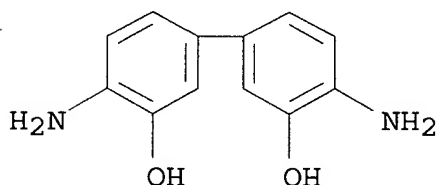




CM 3

CRN 2373-98-0

CMF C12 H12 N2 O2



IC ICM C09J004-06

CC 38-3 (Plastics Fabrication and Uses)

ST **polyimide epoxy** resin acrylic polymer adhesive;  
heat resistant polyimide based adhesiveIT **Epoxy** resins, uses

Polyamic acids

Polyimides, uses

(heat-resistant polyimide-based adhesive compns.)

IT 106-91-2, Glycidyl methacrylate **25068-38-6**, Epikote 82840220-08-4 372111-14-3 **372111-15-4D**, polymer with

diamino polysiloxanes

(heat-resistant polyimide-based adhesive compns.)

L90 ANSWER 11 OF 16 HCAPLUS COPYRIGHT 2003 ACS

2001:814153 Document No. 135:358845 Heat-resistant polyimide-based adhesive compositions. Okada, Yoshifumi; Hara, Masayuki; Nojiri, Hitoshi (Kanegafuchi Chemical Industry Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2001311054 A2 20011109, 13 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-130551 20000428.

AB The title compns., useful for flexible **printed circuit boards**, tapes for tape automated bondings, laminates, etc. (no data), comprise (a) sol. polyimides [e.g., bis[4-(3-aminophenoxy)phenyl]sulfone-2,2-bis(4-hydroxyphenyl)propane dibenzoate-3,3',4,4'-tetracarboxylic dianhydride-diaminobenzoic acid copolymer, bis[4-(3-aminophenoxy)phenyl]sulfone-2,2-bis(4-

hydroxyphenyl)propane dibenzoate-3,3',4,4'-tetracarboxylic dianhydride-3,3'-dihydroxy-4,4'-diaminobiphenyl-diamino polysiloxane copolymer, bis[4-(3-aminophenoxy)phenyl]sulfone-2,2-bis(4-hydroxyphenyl)propane dibenzoate-3,3',4,4'-tetracarboxylic dianhydride copolymer] 100, (b) **epoxy** compds. (e.g., Epikote 828, glycidyl methacrylate, Epiclon HP-4032) 1-100, and (c) compds. having .gtoreq.2 unsatd. double bonds [e.g., isocyanuric acid tris(ethaneacrylate)] 1-150 parts.

IT 25068-38-6, Epikote 828 131406-13-8, Epiclon HP-4032 372111-15-4D, polymer with amino-terminated polysiloxanes  
(heat-resistant polyimide-based adhesive compns.)

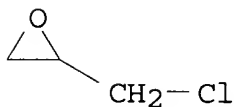
RN 25068-38-6 HCAPLUS

CN Phenol, 4,4'-(1-methylethylidene)bis-, polymer with (chloromethyl)oxirane (9CI) (CA INDEX NAME)

CM 1

CRN 106-89-8

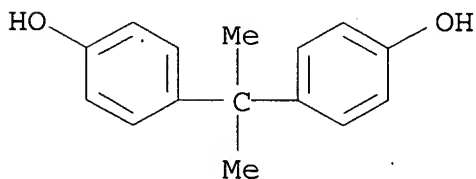
CMF C3 H5 Cl O



CM 2

CRN 80-05-7

CMF C15 H16 O2



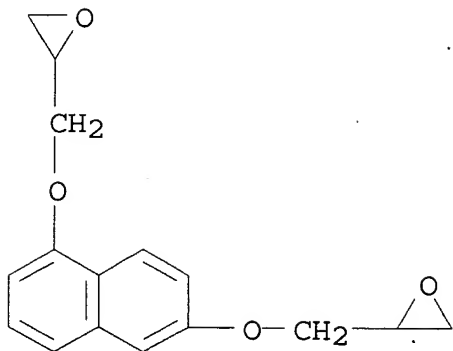
RN 131406-13-8 HCAPLUS

CN Oxirane, 2,2'-[1,6-naphthalenediylbis(oxymethylene)]bis-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 27610-48-6

CMF C16 H16 O4



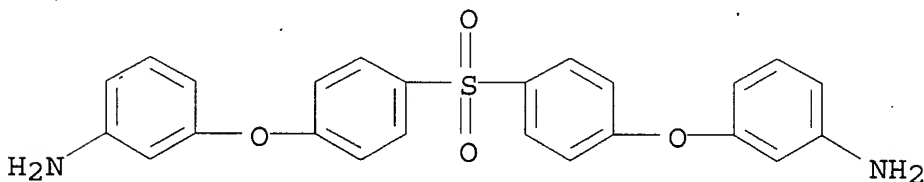
RN 372111-15-4 HCAPLUS

CN 5-Isobenzofurancarboxylic acid, 1,3-dihydro-1,3-dioxo-,  
(1-methylethylidene)di-4,1-phenylene ester, polymer with  
4,4'-diamino[1,1'-biphenyl]-3,3'-diol and 3,3'-[sulfonylbis(4,1-  
phenyleneoxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 30203-11-3

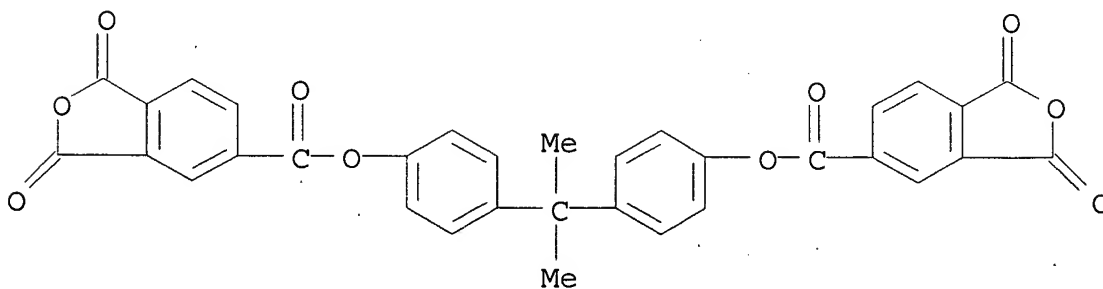
CMF C24 H20 N2 O4 S



CM 2

CRN 2770-50-5

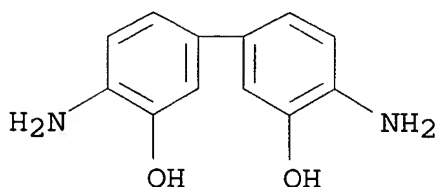
CMF C33 H20 O10



CM 3

CRN 2373-98-0

CMF C12 H12 N2 O2



IC ICM C09J004-06

CC 38-3 (Plastics Fabrication and Uses)

ST **polyimide epoxy** resin acrylic polymer adhesive;  
heat resistant polyimide based adhesiveIT **Epoxy** resins, uses

Polyamic acids

Polyimides, uses

(heat-resistant polyimide-based adhesive compns.)

IT 106-91-2, Glycidyl methacrylate **25068-38-6**, Epikote 82840220-08-4 **131406-13-8**, Epiclon HP-4032 263906-49-6

372111-14-3, Bis[4-(3-aminophenoxy)phenyl]sulfone-2,2-bis(4-

hydroxyphenyl)propane dibenzoate-3,3',4,4'-tetracarboxylic

dianhydride-diaminobenzoic acid copolymer **372111-15-4D**,

polymer with amino-terminated polysiloxanes 372111-16-5D, polymer

with amino-terminated polysiloxanes

(heat-resistant polyimide-based adhesive compns.)

L90 ANSWER 12 OF 16 HCAPLUS COPYRIGHT 2003 ACS

2001:762909 Document No. 135:289926 Laminates containing conductive  
layers, polymer film layers and adhesive layers for multilayer  
**printed circuit boards**. Itoh, Takashi;

Hara, Shoji; Nagano, Hirosaku; Nishinaka, Masaru (Kaneka

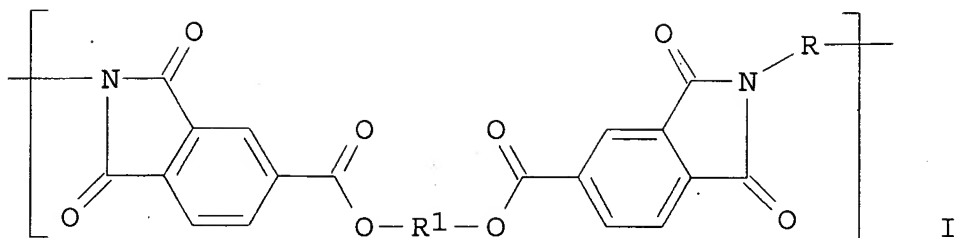
Corporation, Japan). PCT Int. Appl. WO 2001076866 A1 20011018, 60

pp. DESIGNATED STATES: W: JP, KR, US. (Japanese). CODEN: PIXXD2.

APPLICATION: WO 2001-JP3175 20010412. PRIORITY: JP 2000-110199

20000412; JP 2000-224861 20000726.

GI



AB The laminate comprises a conductive layer (e.g., Cu), an adhesive layer [e.g., a blend of bis(4-(3-aminophenoxy)phenyl)sulfone-2,2-bis(4-hydroxyphenyl)propane dibenzoate-3,3',4,4'-tetracarboxylic dianhydride copolymer and bisphenol A **epoxy** resin], a polymer film layer interposed between the conductive layer and the adhesive layer and contg. a polyimide having .gtoreq.1 repeating unit I ( R, R1 = bivalent org. group; e.g., p-phenylenediamine-4,4'-oxydianiline-p-phenylenebis(trimellitic acid monoester anhydride) copolymer). The laminates have good elec. characteristics and phys. balance, high heat-resistance, low coeff. of linear expansion, and stable adhesion between metals and polymer films.

IT 25068-38-6P, Epikote 828 365222-84-0P  
365222-86-2P

(adhesive layer; laminates contg. conductive layers, polymer film layers and adhesive layers for multilayer **printed circuit boards**)

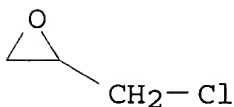
RN 25068-38-6 HCAPLUS

CN Phenol, 4,4'-(1-methylethylidene)bis-, polymer with (chloromethyl)oxirane (9CI) (CA INDEX NAME)

CM 1

CRN 106-89-8

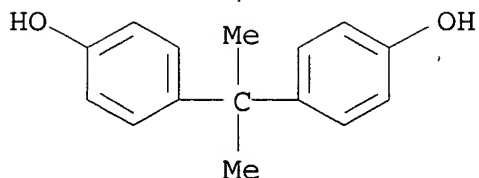
CMF C3 H5 Cl O



CM 2

CRN 80-05-7

CMF C15 H16 O2



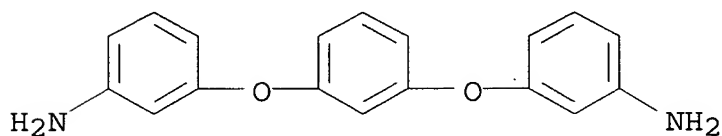
RN 365222-84-0 HCAPLUS

CN 5-Isobenzofurancarboxylic acid, 1,3-dihydro-1,3-dioxo-,  
(1-methylethylidene)di-4,1-phenylene ester, polymer with  
4,4'-diamino[1,1'-biphenyl]-3,3'-diol and 3,3'-[1,3-  
phenylenebis(oxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 10526-07-5

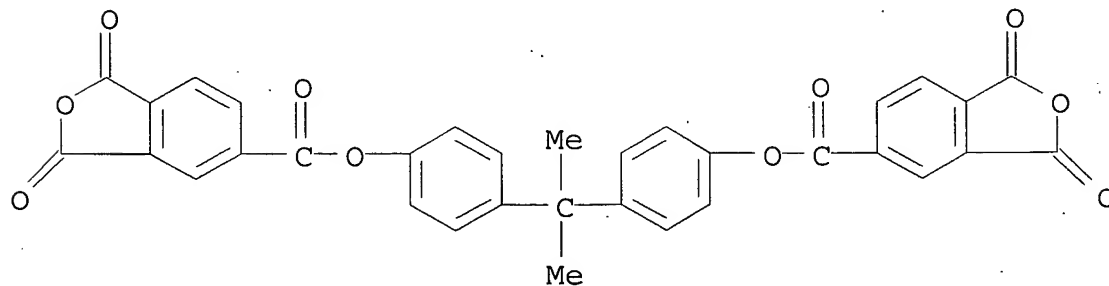
CMF C18 H16 N2 O2



CM 2

CRN 2770-50-5

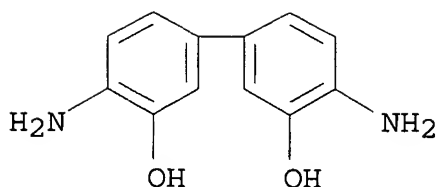
CMF C33 H20 O10



CM 3

CRN 2373-98-0

CMF C12 H12 N2 O2



RN 365222-86-2 HCAPLUS

CN 5-Isobenzofurancarboxylic acid, 1,3-dihydro-1,3-dioxo-,  
(1-methylethylidene)di-4,1-phenylene ester, polymer with Adeka EPU  
73, 4,4'-diamino[1,1'-biphenyl]-3,3'-diol, 2,2',2''-  
[methylidynetris(phenyleneoxymethylene)]tris[oxirane],  
3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] and  
4,4'-sulfonylbis[benzenamine] (9CI) (CA INDEX NAME)

CM .1

CRN 137878-94-5

CMF Unspecified

CCI PMS, MAN

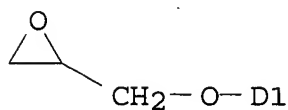
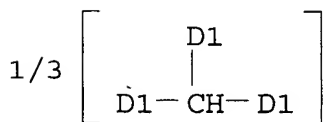
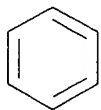
\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 2

CRN 66072-38-6

CMF C28 H28 O6

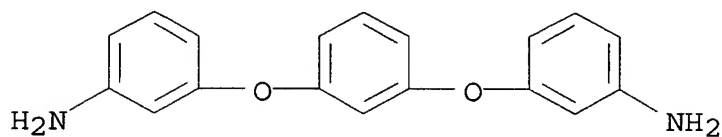
CCI IDS



CM 3

CRN 10526-07-5

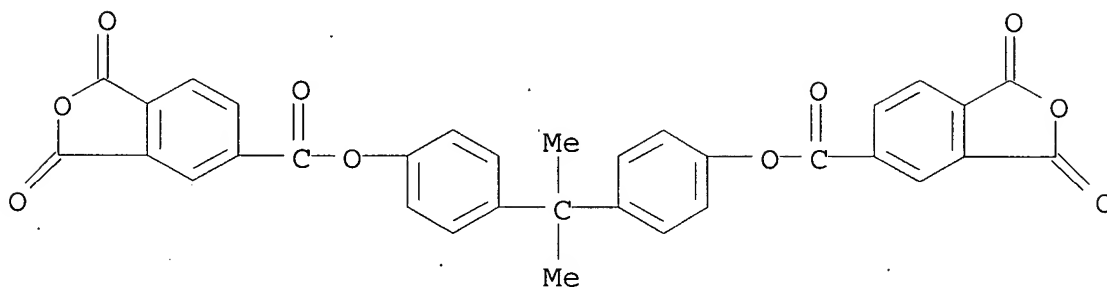
CMF C18 H16 N2 O2



CM 4

CRN 2770-50-5

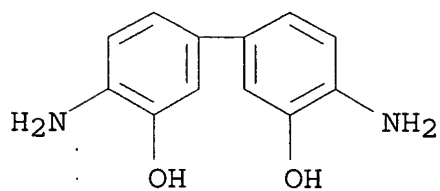
CMF C33 H20 O10



CM 5

CRN 2373-98-0

CMF C12 H12 N2 O2

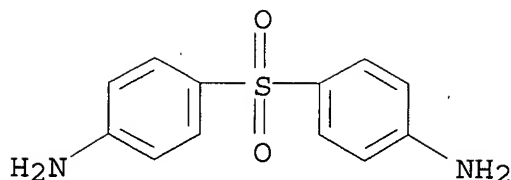


CM 6

CRN 80-08-0

CMF C12 H12 N2 O2 S



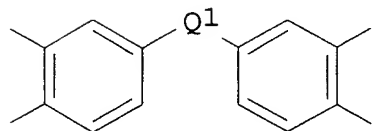
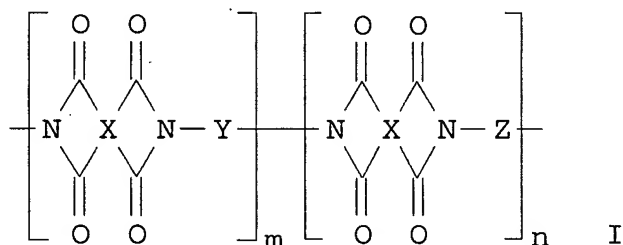


- IC ICM B32B027-00  
ICS H05K003-46
- CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 76
- ST multilayer laminate **printed circuit board**; copper conductive layer multilayer laminate; polyimide film multilayer laminate **circuit board**; **epoxy** resin **polyimide** blend adhesive layer
- IT Polyimides, uses  
(adhesive layer and films; laminates contg. conductive layers, polymer film layers and adhesive layers for multilayer **printed circuit boards**)
- IT **Epoxy** resins, uses  
(adhesive layer; laminates contg. conductive layers, polymer film layers and adhesive layers for multilayer **printed circuit boards**)
- IT Metals, uses  
(conductive layers; laminates contg. conductive layers, polymer film layers and adhesive layers for multilayer **printed circuit boards**)
- IT Polyurethanes, uses  
(**epoxy-polyimide-**, adhesive layer; laminates contg. conductive layers, polymer film layers and adhesive layers for multilayer **printed circuit boards**)
- IT **Polyimides**, uses  
(**epoxy-polyurethane-**, adhesive layer; laminates contg. conductive layers, polymer film layers and adhesive layers for multilayer **printed circuit boards**)
- IT Adhesives  
**Printed circuit boards**  
(laminates contg. conductive layers, polymer film layers and adhesive layers for multilayer **printed circuit boards**)
- IT Laminated plastics, uses  
(laminates contg. conductive layers, polymer film layers and adhesive layers for multilayer **printed circuit boards**)
- IT **Epoxy** resins, uses  
(**polyimide-polyurethane-**, adhesive layer; laminates contg. conductive layers, polymer film layers and adhesive layers for multilayer **printed circuit boards**)

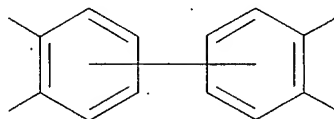
- IT 25068-38-6P, Epikote 828 177345-59-4P,  
4,4'-Diaminodiphenyl sulfone-Epikote 1032H60 copolymer  
263906-49-6P 263906-50-9P **365222-84-0P**  
**365222-86-2P**  
(adhesive layer; laminates contg. conductive layers, polymer film  
layers and adhesive layers for multilayer **printed**  
**circuit boards**)
- IT 7440-50-8; Copper, uses  
(conductive layer; laminates contg. conductive layers, polymer  
film layers and adhesive layers for multilayer **printed**  
**circuit boards**)
- IT 203644-90-0P 240128-65-8P  
(film; laminates contg. conductive layers, polymer film layers  
and adhesive layers for multilayer **printed**  
**circuit boards**)

L90 ANSWER 13 OF 16 HCAPLUS COPYRIGHT 2003 ACS  
1998:479992 Document No. 129:168107 Photopolymerizable  
polyimide-siloxane composition for formation of patterned film.  
Kato, Hideto (Shin-Etsu Chemical Industry Co., Ltd., Japan). Jpn.  
Kokai Tokkyo Koho JP 10195294 A2 19980728 Heisei, 9 pp. (Japanese).  
CODEN: JKXXAF. APPLICATION: JP 1997-13384 19970109.

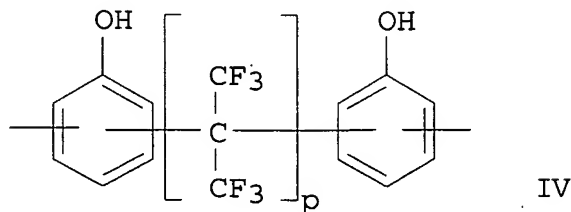
GI



II



III



IV

AB The compn. contains (a) polyimides I [X = arylene group II, III; Q1 = C(CF<sub>3</sub>)<sub>2</sub>, SiMe<sub>2</sub>OSiMe<sub>2</sub>, O; 30-100 mol% of Y = phenolic OH-contg. arylene group IV and the rest of Y = C<sub>6</sub>H<sub>4</sub>OQ<sub>2</sub>OC<sub>6</sub>H<sub>4</sub>; Q<sub>2</sub> = C<sub>6</sub>H<sub>4</sub>, C<sub>6</sub>H<sub>4</sub>CMe<sub>2</sub>C<sub>6</sub>H<sub>4</sub>, C<sub>6</sub>H<sub>4</sub>C(CF<sub>3</sub>)<sub>2</sub>C<sub>6</sub>H<sub>4</sub>; Z = (CH<sub>2</sub>)<sub>3</sub>SiMe<sub>2</sub>(OSiMe<sub>2</sub>)<sub>b</sub>(CH<sub>2</sub>)<sub>3</sub>; b = 5-80; m/(m + n) = 0.70-0.98; n/(m + n) = 0.02-0.30] having wt. av. mol. wt. 5000-150,000, (b) **epoxy**-contg. (meth)acrylate esters, and (c) sensitizers and/or photopolymn. initiators. The compn. shows improved sensitivity in formation of thick film and the resulting patterned film shows improved adhesion to substrate, e.g., semiconductor substrate, **printed circuit board**, etc., after low temp. treatment.

IT 211030-30-7P 211030-31-8P 211030-32-9P  
(polyimides contg. epoxy-contg.  
(meth)acrylates for thick film photoresist with improved adhesion to substrates)

RN 211030-30-7 HCAPLUS

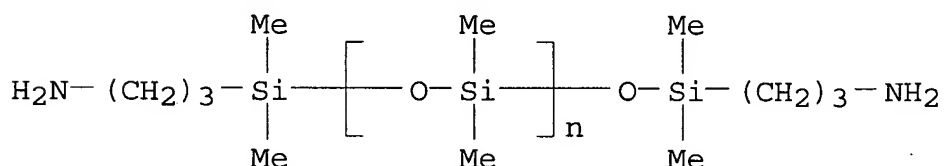
CN 1,3-Isobenzofurandione, 5,5'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis-, polymer with .alpha.-[(3-aminopropyl)dimethylsilyl]-.omega.-[[[(3-aminopropyl)dimethylsilyl]oxy]poly[oxy(dimethylsilylene)]] and 3,3'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[6-aminophenol], block (9CI) (CA INDEX NAME)

CM 1

CRN 97917-34-5

CMF (C<sub>2</sub> H<sub>6</sub> O Si)<sub>n</sub> C<sub>10</sub> H<sub>28</sub> N<sub>2</sub> O Si<sub>2</sub>

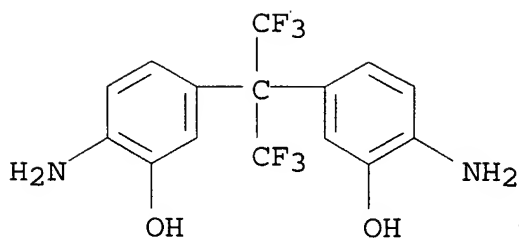
CCI PMS



CM 2

CRN 22428-25-7

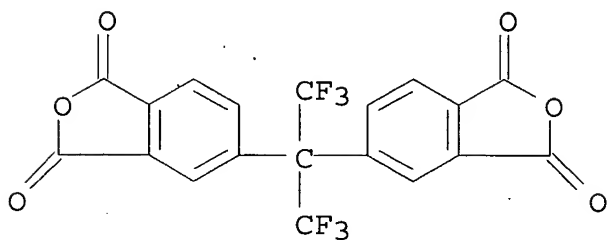
CMF C<sub>15</sub> H<sub>12</sub> F<sub>6</sub> N<sub>2</sub> O<sub>2</sub>



CM 3

CRN 1107-00-2

CMF C19 H6 F6 O6



RN 211030-31-8 HCAPLUS

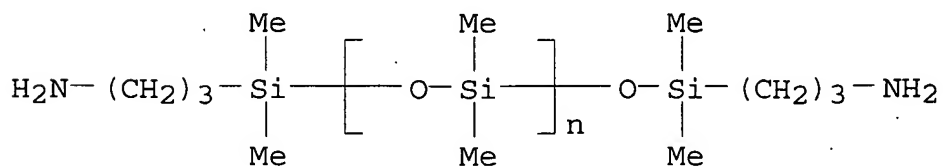
CN [5,5'-Biisobenzofuran]-1,1',3,3'-tetrone, polymer with .alpha.-[(3-aminopropyl)dimethylsilyl]-.omega.-[[[(3-aminopropyl)dimethylsilyl]oxy]poly[oxy(dimethylsilylene)], 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine], 5,5'-(1,1,3,3-tetramethyl-1,3-disiloxanediyl)bis[1,3-isobenzofurandione] and 3,3'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[6-aminophenol], block (9CI) (CA INDEX NAME)

CM 1

CRN 97917-34-5

CMF (C2 H6 O Si)<sub>n</sub> C10 H28 N2 O Si2

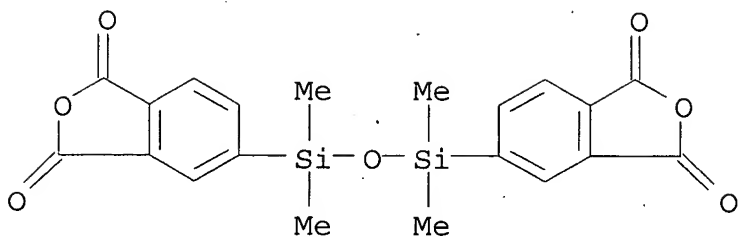
CCI PMS



CM 2

CRN 42297-28-9

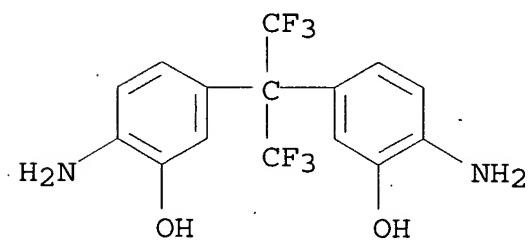
CMF C20 H18 O7 Si2



CM 3

CRN 22428-25-7

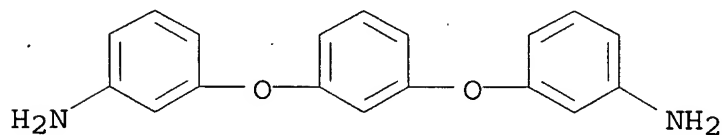
CMF C15 H12 F6 N2 O2



CM 4

CRN 10526-07-5

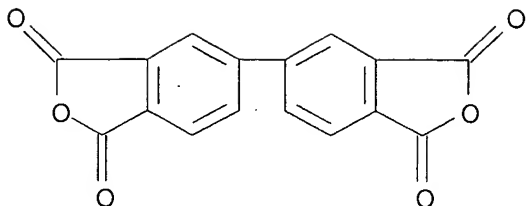
CMF C18 H16 N2 O2



CM 5

CRN 2420-87-3

CMF C16 H6 O6



RN 211030-32-9 HCAPLUS

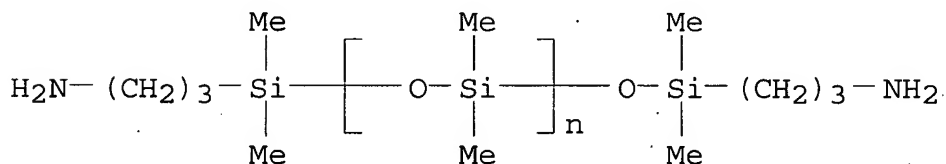
CN 1,3-Isobenzofurandione, 5,5'-oxybis-, polymer with .alpha.-[(3-aminopropyl)dimethylsilyl]-.omega.-[[[(3-aminopropyl)dimethylsilyl]oxy]poly[oxy(dimethylsilylene)], 4,4'-diamino[1,1'-biphenyl]-3,3'-diol and 5,5'-(1,1,3,3-tetramethyl-1,3-disiloxanediyl)bis[1,3-isobenzofurandione] (9CI) (CA INDEX NAME)

CM 1

CRN 97917-34-5

CMF (C2 H6 O Si)<sub>n</sub> C10 H28 N2 O Si2

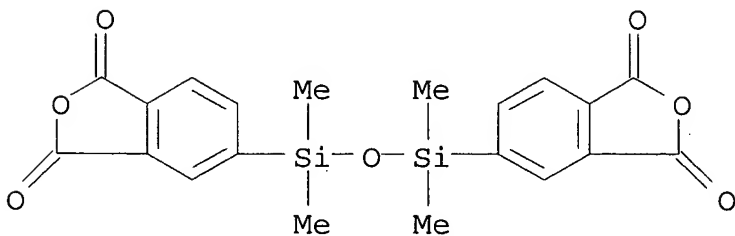
CCI PMS



CM 2

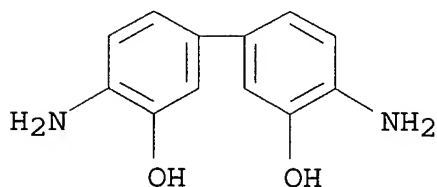
CRN 42297-28-9

CMF C20 H18 O7 Si2



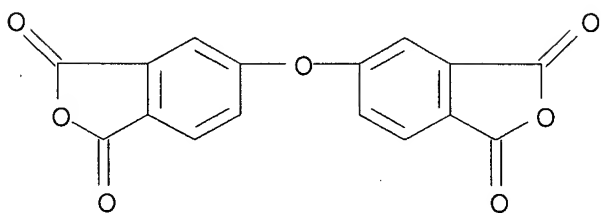
CM 3

CRN 2373-98-0  
CMF C12 H12 N2 O2



CM 4

CRN 1823-59-2  
CMF C16 H6 O7



- IC ICM C08L079-08  
ICS C09D004-06
- CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
Section cross-reference(s): 37
- ST photopolymerizable compn **polyimide epoxy**  
acrylate methacrylate; thick film photoresist polyimide acrylate methacrylate; adhesion photoresist polyimide blend semiconductor device; **printed circuit** adhesion photoresist polyimide blend
- IT Polymerization catalysts  
(photopolymn.; in **polyimides** contg. **epoxy** -contg. (meth)acrylates for thick film photoresist with improved adhesion to substrates)
- IT Photoresists  
(**polyimides** contg. **epoxy**-contg. (meth)acrylates for thick film photoresist with improved adhesion to substrates)
- IT Semiconductor devices  
(**polyimides** contg. **epoxy**-contg. (meth)acrylates for thick film photoresist with improved adhesion to substrates for)
- IT Polyimides, uses  
(polysiloxane-; **polyimides** contg. **epoxy**

- contg. (meth)acrylates for thick film photoresist with improved adhesion to substrates)
- IT 103-01-5 105-16-8, Diethylaminoethyl methacrylate 1076-59-1, 3-Phenyl-5-isoxazolone 1707-68-2 10287-54-4, Ethyl 4-diethylaminobenzoate 63226-13-1 211030-33-0 (photopolymer. initiators; **polyimides** contg. **epoxy**-contg. (meth)acrylates for thick film photoresist with improved adhesion to substrates)
- IT 211030-30-7P 211030-31-8P 211030-32-9P (**polyimides** contg. **epoxy**-contg. (meth)acrylates for thick film photoresist with improved adhesion to substrates)
- IT 106-91-2 41768-20-1 64630-63-3 (**polyimides** contg. **epoxy**-contg. (meth)acrylates for thick film photoresist with improved adhesion to substrates)

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1997:435737 Document No. 127:67419 Solvent-thinned polyimide-polysiloxane compositions with good bonding strengths, flexibility and resistance to chemicals and soldering heat. Ishikawa, Seiji; Yasuno, Hiroshi; Nakatani, Masayuki; Yamamoto, Shigeru (Ube Industries, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 09118807 A2 19970506 Heisei, 14 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1996-217047 19960819. PRIORITY: JP 1995-213417 19950822.

AB The storage-stable and thermally curable compns., useful as coatings for protection of flexible **circuit board** surface, comprise (A) **polyimide**-polysiloxanes 100, (B) **epoxy** resins 1-50, and (C) BaSO<sub>4</sub> 2-150 parts where the A is derived from arom. tetracarboxylic acid compds., amino group-terminated siloxanes and arom. diamine compds. bearing OH or COOH groups and optionally other arom. diamines. Thus, mixing 2,3,3',4'-biphenyltetracarboxylic dianhydride in Triglyme with .alpha.,.omega.-bis(3-aminopropyl)polydimethylsiloxane while heating, then mixing with 2,2-bis[4-(4-aminophenoxy)phenyl]propane and 3,5-diaminobenzoic acid gave a polyimide-polysiloxane for use in coating contg. also **epoxy** resin and BaSO<sub>4</sub>.

IT 183733-63-3, 2,3,3',4'-Biphenyltetracarboxylic dianhydride-2,2-bis[4-(4-aminophenoxy)phenyl]propane-3,3'-dihydroxy-4,4'-diaminobiphenyl-X 22 161AS copolymer 183733-65-5, 2,2-Bis[4-(4-aminophenoxy)phenyl]propane-3,3'-dihydroxy-4,4'-diaminobiphenyl-3,3',4,4'-diphenyl ether tetracarboxylic dianhydride-X 22 161AS copolymer 183733-67-7, 2,2-Bis[4-(4-aminophenoxy)phenyl]propane-3,3',4,4'-diphenyl sulfone tetracarboxylic dianhydride-3,3'-dihydroxy-4,4'-diaminobiphenyl-X 22 161AS copolymer 183733-69-9, 2,2-Bis[4-(4-aminophenoxy)phenyl]propane-2,2-bis(3,4-benzenedicarboxylic anhydride)hexafluoropropane-3,3'-dihydroxy-4,4'-diaminobiphenyl-X 22 161AS copolymer 183733-77-9, 2,3,3',4'-Biphenyltetracarboxylic dianhydride-2,2-bis[4-(4-aminophenoxy)phenyl]propane-bis(3-hydroxy-4-aminophenyl)methane-X 22



## 161AS copolymer

(thermally-curable coating compns. with **epoxy** resins;  
solvent-thinned **polyimide**-polysiloxane compns. with  
good bonding strengths, flexibility and resistance to chems. and  
soldering heat)

RN 183733-63-3 HCAPLUS

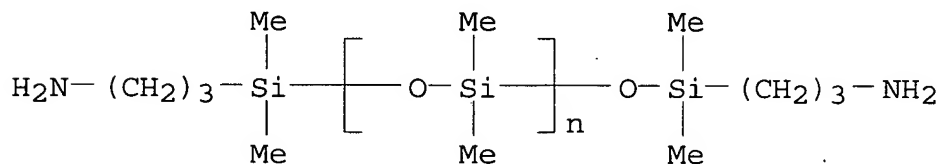
CN [4,5'-Biisobenzofuran]-1,1',3,3'-tetrone, polymer with  
.alpha.-[(3-aminopropyl)dimethylsilyl]-.omega.-[[[(3-  
aminopropyl)dimethylsilyl]oxy]poly[oxy(dimethylsilylene)],  
4,4'-diamino[1,1'-biphenyl]-3,3'-diol and 4,4'-[(1-  
methylethylidene)bis(4,1-phenyleneoxy)]bis[benzenamine] (9CI) (CA  
INDEX NAME)

CM 1

CRN 97917-34-5

CMF (C2 H6 O Si)<sub>n</sub> C10 H28 N2 O Si2

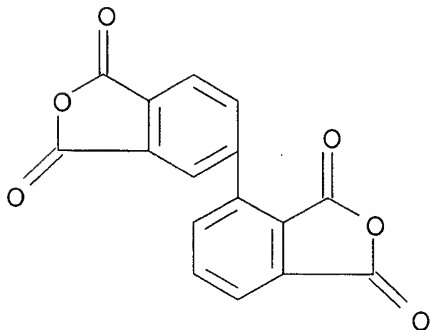
CCI PMS



CM 2

CRN 36978-41-3

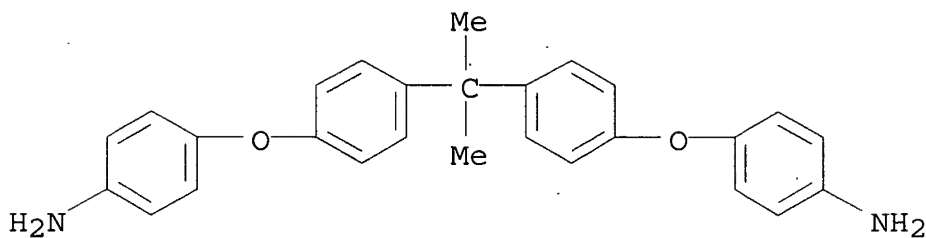
CMF C16 H6 O6



CM 3

CRN 13080-86-9

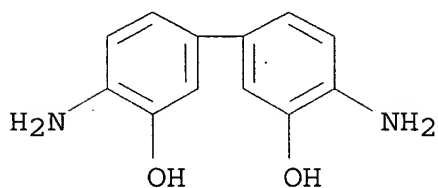
CMF C27 H26 N2 O2



CM 4

CRN 2373-98-0

CMF C12 H12 N2 O2



RN 183733-65-5 HCAPLUS

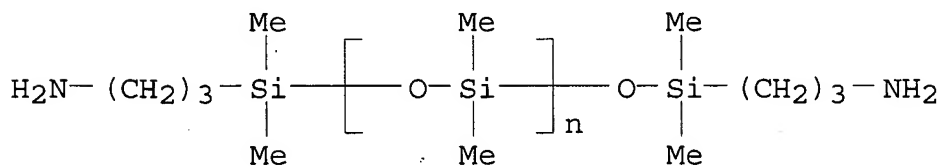
CN 1,3-Isobenzofurandione, 5,5'-oxybis-, polymer with  
 .alpha.-[(3-aminopropyl)dimethylsilyl]-.omega.-[[[(3-aminopropyl)dimethylsilyl]oxy]poly[oxy(dimethylsilylene)]],  
 4,4'-diamino[1,1'-biphenyl]-3,3'-diol and 4,4'-[(1-methylethylidene)bis(4,1-phenyleneoxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 97917-34-5

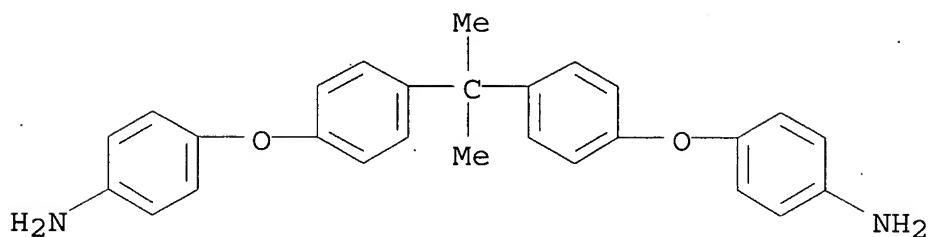
CMF (C2 H6 O Si)<sub>n</sub> C10 H28 N2 O Si2

CCI PMS



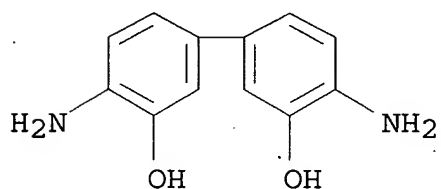
CM 2

CRN 13080-86-9  
CMF C27 H26 N2 O2



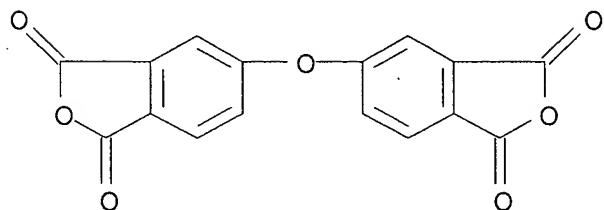
CM 3

CRN 2373-98-0  
CMF C12 H12 N2 O2



CM 4

CRN 1823-59-2  
CMF C16 H6 O7



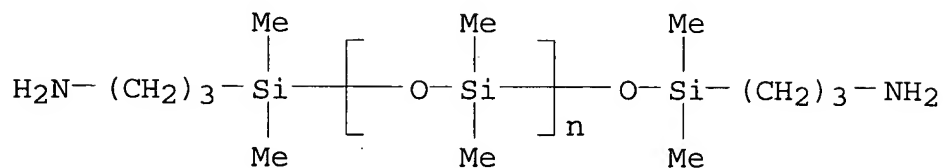
RN 183733-67-7 HCAPLUS  
CN 1,3-Isobenzofurandione, 5,5'-sulfonylbis-, polymer with  
.alpha.-[(3-aminopropyl)dimethylsilyl]-.omega.-[[3-aminopropyl)dimethylsilyl]oxy]poly[oxy(dimethylsilylene)],  
4,4'-diamino[1,1'-biphenyl]-3,3'-diol and 4,4'-[(1-methylethylidene)bis(4,1-phenyleneoxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 97917-34-5

CMF (C2 H6 O Si)<sub>n</sub> C10 H28 N2 O Si2

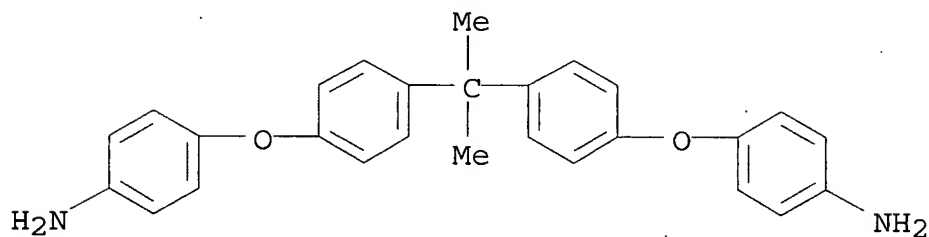
CCI PMS



CM 2

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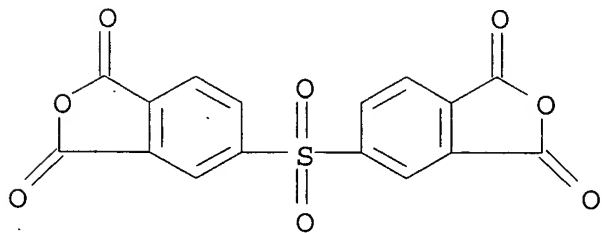
CMF C27 H26 N2 O2



CM 3

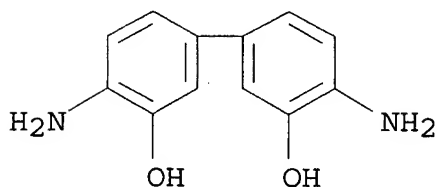
CRN 2540-99-0

CMF C16 H6 O8 S



CM 4

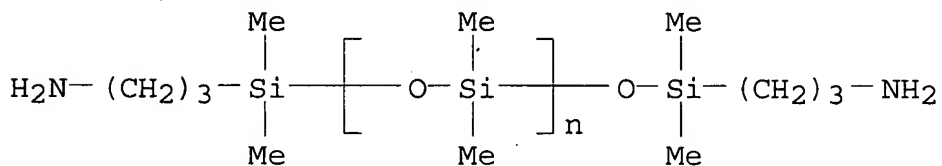
CRN 2373-98-0  
CMF C12 H12 N2 O2



RN 183733-69-9 HCAPLUS  
CN 1,3-Isobenzofurandione, 5,5'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis-, polymer with .alpha.-[(3-aminopropyl)dimethylsilyl]-.omega.-[[[(3-aminopropyl)dimethylsilyl]oxy]poly[oxy(dimethylsilylene)]], 4,4'-diamino[1,1'-biphenyl]-3,3'-diol and 4,4'-[(1-methylethylidene)bis(4,1-phenyleneoxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

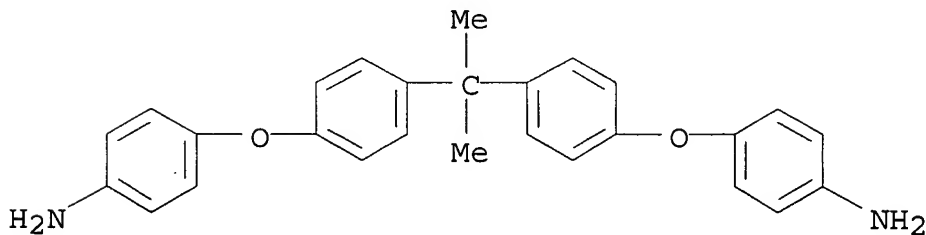
CM 1

CRN 97917-34-5  
CMF (C2 H6 O Si)<sub>n</sub> C10 H28 N2 O Si2  
CCI PMS



CM 2

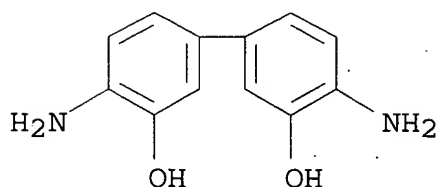
CRN 13080-86-9  
CMF C27 H26 N2 O2



CM 3

CRN 2373-98-0

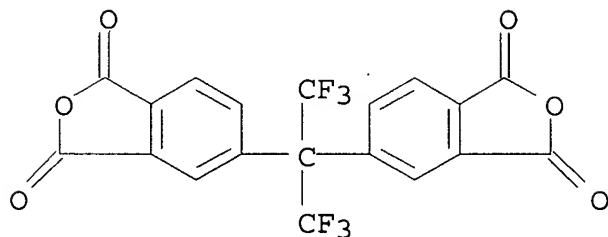
CMF C12 H12 N2 O2



CM 4

CRN 1107-00-2

CMF C19 H6 F6 O6



RN 183733-77-9 HCAPLUS

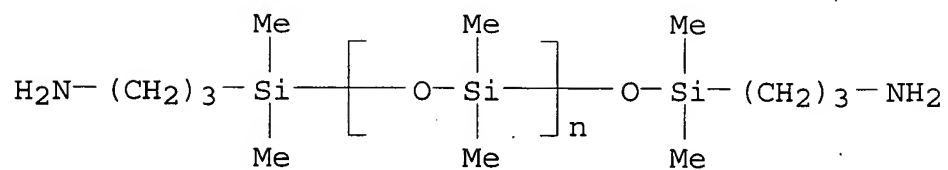
CN [4,5'-Biisobenzofuran]-1,1',3,3'-tetrone, polymer with  
 .alpha.-[(3-aminopropyl)dimethylsilyl]-.omega.-[[[(3-aminopropyl)dimethylsilyl]oxy]poly[oxy(dimethylsilylene)]],  
 3,3'-methylenebis[6-aminophenol] and 4,4'-[(1-methylethylidene)bis(4,1-phenyleneoxy)]bis[benzenamine] (9CI) (CA  
 INDEX NAME)

CM 1

CRN 97917-34-5

CMF (C2 H6 O Si)n C10 H28 N2 O Si2

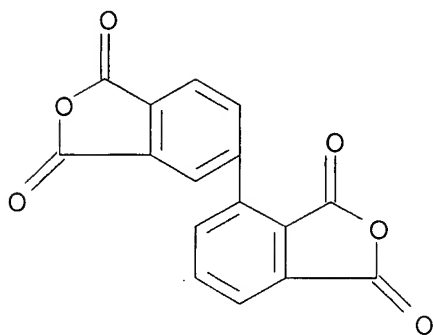
CCI PMS



CM 2

CRN 36978-41-3

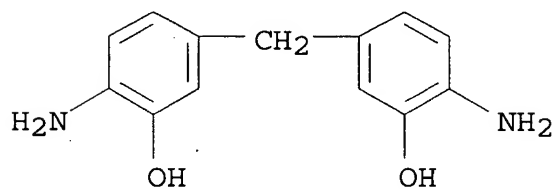
CMF C16 H6 O6



CM 3

CRN 22428-30-4

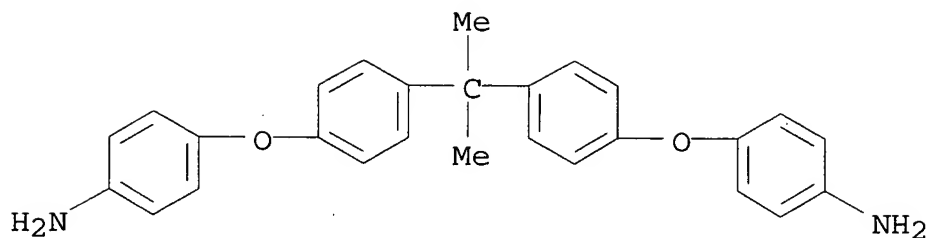
CMF C13 H14 N2 O2



CM 4

CRN 13080-86-9

CMF C27 H26 N2 O2



- IC ICM C08L063-00  
ICS C08K003-30; C08L079-08; C08G073-10
- CC 42-10 (Coatings, Inks, and Related Products)  
Section cross-reference(s): 76
- ST polyimide polysiloxane copolymer thermosetting coating; flexible **circuit board** protective coating; siliconized polyimide coating **circuit board**; chem resistance amino siloxane polyimide coating; soldering heat resistance siloxane polyimide coating; barium sulfate filler siloxane polyimide coating; **epoxy** curable amino siloxane **polyimide** coating; heat resistance amino siloxane polyimide coating; amino siloxane polyimide coating **circuit board**; diaminobenzoic aminosiloxane tetracarboxylic dianhydride copolymer
- IT **Epoxy** resins, uses  
(curing agents; solvent-thinned polyimide-polysiloxane compns. with good bonding strengths, flexibility and resistance to chems. and soldering heat)
- IT Polysiloxanes, uses  
Polysiloxanes, uses  
(polyimide-, thermally-curable coating compns. with **epoxy** resins; solvent-thinned **polyimide**-polysiloxane compns. with good bonding strengths, flexibility and resistance to chems. and soldering heat)
- IT Polyimides, uses  
Polyimides, uses  
(polysiloxane-, thermally-curable coating compns. with **epoxy** resins; solvent-thinned **polyimide**-polysiloxane compns. with good bonding strengths, flexibility and resistance to chems. and soldering heat)
- IT Coating materials  
**Printed circuit boards**  
(solvent-thinned polyimide-polysiloxane compns. with good bonding strengths, flexibility and resistance to chems. and soldering heat)
- IT 159554-37-7, 2,3,3',4'-Biphenyltetracarboxylic dianhydride-2,2-bis[4-(4-aminophenoxy)phenyl]propane-3,5-diaminobenzoic acid-X 22 161AS copolymer 169503-26-8, 2,3,3',4'-Biphenyltetracarboxylic dianhydride-2,2-bis[4-(4-aminophenoxy)phenyl]propane-X 22 161AS copolymer 183733-57-5, Bis(3-carboxy-4-aminophenyl)methane-2,3,3',4'-biphenyltetracarboxylic dianhydride-2,2-bis[4-(4-aminophenoxy)phenyl]propane-X 22 161AS copolymer 183733-59-7,

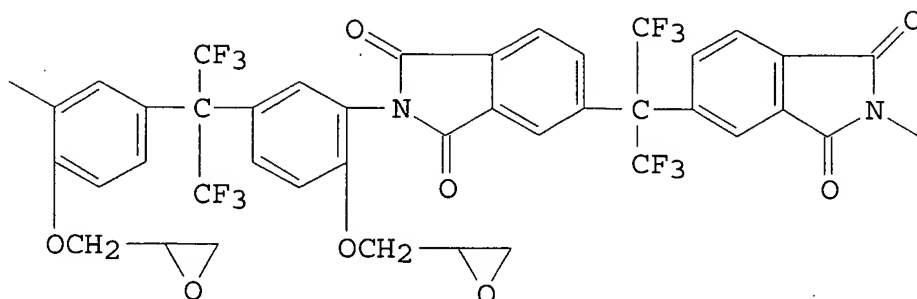


2,2-Bis[4-(4-aminophenoxy)phenyl]propane-bis(3-carboxy-4-aminophenyl)methane-3,3',4,4'-diphenyl ether tetracarboxylic dianhydride-X 22 161AS copolymer 183733-61-1, 2,2-Bis[4-(4-aminophenoxy)phenyl]propane-bis(3-carboxy-4-aminophenyl)methane-3,3',4,4'-diphenyl sulfone tetracarboxylic dianhydride-X 22 161AS copolymer 183733-63-3, 2,3,3',4'-Biphenyltetracarboxylic dianhydride-2,2-bis[4-(4-aminophenoxy)phenyl]propane-3,3'-dihydroxy-4,4'-diaminobiphenyl-X 22 161AS copolymer 183733-65-5, 2,2-Bis[4-(4-aminophenoxy)phenyl]propane-3,3'-dihydroxy-4,4'-diaminobiphenyl-3,3',4,4'-diphenyl ether tetracarboxylic dianhydride-X 22 161AS copolymer 183733-67-7, 2,2-Bis[4-(4-aminophenoxy)phenyl]propane-3,3',4,4'-diphenyl sulfone tetracarboxylic dianhydride-3,3'-dihydroxy-4,4'-diaminobiphenyl-X 22 161AS copolymer 183733-69-9, 2,2-Bis[4-(4-aminophenoxy)phenyl]propane-2,2-bis(3,4-benzenedicarboxylic anhydride)hexafluoropropane-3,3'-dihydroxy-4,4'-diaminobiphenyl-X 22 161AS copolymer 183733-70-2, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride-2,3,3',4'-Biphenyltetracarboxylic dianhydride-2,2-bis[4-(4-aminophenoxy)phenyl]propane-bis(3-carboxy-4-aminophenyl)methane-X 22 161AS copolymer 183733-72-4, 2,3,3',4'-Biphenyltetracarboxylic dianhydride-2,2-bis[4-(4-aminophenoxy)phenyl]propane-bis(3-carboxy-4-aminophenyl)methane-pyromellitic dianhydride-X 22 161AS copolymer 183733-77-9, 2,3,3',4'-Biphenyltetracarboxylic dianhydride-2,2-bis[4-(4-aminophenoxy)phenyl]propane-bis(3-hydroxy-4-aminophenyl)methane-X 22 161AS copolymer 183733-79-1, Bis(3-carboxy-4-aminophenyl)methane-2,3,3',4'-biphenyltetracarboxylic dianhydride-X 22 161AS copolymer 191092-22-5, 2,3,3',4'-Biphenyltetracarboxylic dianhydride-4,4'-diaminodiphenyl ether-3,5-diaminobenzoic acid-X 22 161AS copolymer 191092-23-6, 2,3,3',4'-Biphenyltetracarboxylic dianhydride-3,5-diaminobenzoic acid-1,4-bis(4-aminophenoxy)benzene-X 22 161AS copolymer 191092-24-7, 2,3,3',4'-Biphenyltetracarboxylic dianhydride-2,2-bis[4-(4-aminophenoxy)phenyl]propane-2,2-bis(3,4-benzenedicarboxylic anhydride)hexafluoropropane-X 22 161AS copolymer (thermally-curable coating compns. with **epoxy** resins; solvent-thinned **polyimide**-polysiloxane compns. with good bonding strengths, flexibility and resistance to chems. and soldering heat)

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1993:450567 Document No. 119:50567 Fluorine-containing polyimides and compositions containing the same. Shiba, Shoji; Yamagishi, Yasuo (Fujitsu Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 04314730 A2 19921105 Heisei, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1991-79453 19910412.

GI



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No  
Cyanate

AB The title compns. useful for solvent-resistant **circuit board** contain polyimide of I repeating unit and diamines in org. solvents. 5,5'-Hexafluoroisopropylidenebis(phthalic anhydride) was polymd. with 2,2-bis(3-amino-4-hydroxyphenyl)hexafluoropropane in N-methylpyrrolidone to form a polyimide which was treated with epichlorohydrin, dissolved with 2,2-bis(3-amino-4-methylphenyl)hexafluoropropane in N-methylpyrrolidone, spin-coated on a glass plate, and heat-cured to give a crack-free film insol. in N-methylpyrrolidone, acetone, toluene, etc.

IT 148855-47-4P

(manuf. of solvent-resistant, for **printed circuit boards**)

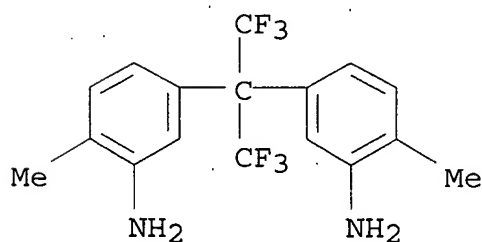
RN 148855-47-4 HCAPLUS

CN 1,3-Isobenzofurandione, 5,5'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis-, polymer with (chloromethyl)oxirane, 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[2-aminophenol] and 3,3'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[6-methylbenzenamine] (9CI) (CA INDEX NAME)

CM 1

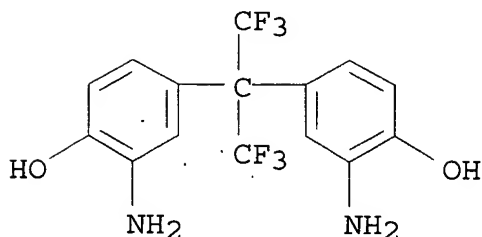
CRN 116325-74-7

CMF C17 H16 F6 N2



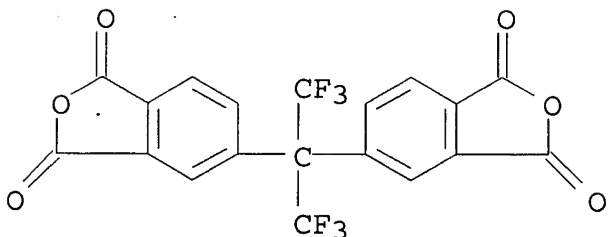
CM 2

CRN 83558-87-6  
CMF C15 H12 F6 N2 O2



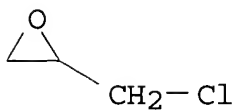
CM 3

CRN 1107-00-2  
CMF C19 H6 F6 O6



CM 4

CRN 106-89-8  
CMF C3 H5 Cl O

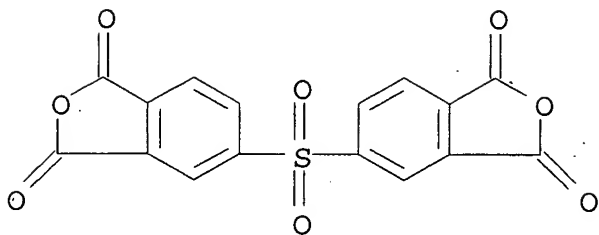


IC ICM C08G073-10  
ICS C08G059-26; C08K005-17; C08L079-08; H01L021-312; H01L021-90  
CC 37-6 (Plastics Manufacture and Processing)  
Section cross-reference(s): 76  
ST **epoxy polyimide printed circuit board; bisaminomethylphenylhexafluoropropylene crosslinked epoxidized polyimide;**

bisaminohydroxyphenylhexa fluoropropane **polyimide epoxidized**; fluoroisopropylidenebisphthalic **polyimide epoxidized**; fluorine contg **epoxy polyimide**

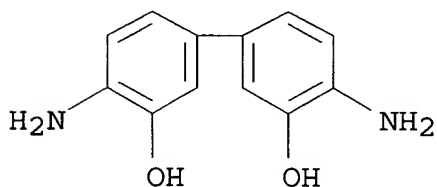
- IT Electric insulators and **Dielectrics**  
(films, fluorine-contg. **epoxy resin-polyimide** films, solvent-resistant)
- IT **Polyimides**, preparation  
(**epoxy**, fluorine-contg., manuf. of solvent-resistant, for **printed circuit boards**)
- IT Fluoropolymers  
(**epoxy-polyimide-**, manuf. of solvent-resistant, for **printed circuit boards**)
- IT **Epoxy** resins, preparation  
(**polyimide-**, fluorine-contg., manuf. of solvent-resistant, for **printed circuit boards**)
- IT Electric circuits  
(**printed, boards**, fluorine-contg. **epoxy resin-polyimides** for, solvent-resistant)
- IT 148855-47-4P  
(manuf. of solvent-resistant, for **printed circuit boards**)
- L90 ANSWER 16 OF 16 HCAPLUS COPYRIGHT 2003 ACS  
1993:256352 Document No. 118:256352 **Epoxy** resin-**polyimide** blended adhesive sheets for **printed circuit boards**. Ueda, Atsushi; Mitsuya, Shoji (Nitto Denko Corp, Japan). Jpn. Kokai Tokkyo Koho JP 05009441 A2 19930119 Heisei, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1991-189126 19910702.
- AB Heat-resistant title adhesive sheets for prevention of Cu foil migration comprise (A) compns. contg. **epoxy** resins having .gtoreq.2 **epoxy** groups and curing agents and (B) A-compatible polyimides, with mol. wt. .gtoreq.5000 and higher heat distortion temp. than glass transition temp. of the cured **epoxy** resins. Thus, mixing Epikote 828, Epikote 1010, and C11Z-CN curing agent, blending with Ultem 1000, casting on a rolled Cu foil, heating at 120.degree. for 2 h, laminating with another Cu foil at 150.degree., and curing at 160.degree. for 2 h gave a substrate showing 90.degree. peel strength 1.2 kg/cm2 initially and 1.1 kg/cm2 after 1000 h at 150.degree..
- IT 147965-59-1  
(**epoxy** resin blends, adhesives, heat-resistant, for **printed circuits**)
- RN 147965-59-1 HCAPLUS  
CN 1,3-Isobenzofurandione, 5,5'-sulfonylbis-, polymer with 4,4'-diamino[1,1'-biphenyl]-3,3'-diol (9CI) (CA INDEX NAME)

CRN 2540-99-0  
CMF C16 H6 O8 S



CM 2

CRN 2373-98-0  
CMF C12 H12 N2 O2



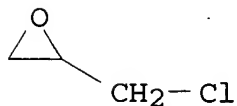
IT 25068-38-6, Epikote 828  
(polyimide blends, adhesives, heat-resistant, for printed circuits)

RN 25068-38-6 HCAPLUS

CN Phenol, 4,4'-(1-methylethylidene)bis-, polymer with (chloromethyl)oxirane (9CI) (CA INDEX NAME)

CM 1

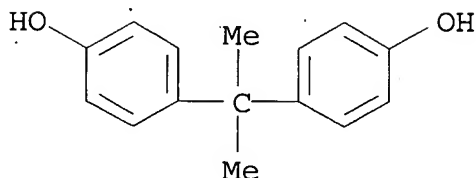
CRN 106-89-8  
CMF C3 H5 Cl O



CM 2

CRN 80-05-7

CMF C15 H16 O2



- IC ICM C09J007-00  
ICS C09J007-00; C09J163-00
- ICA C08L063-00
- CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 76
- ST **epoxy polyimide adhesive printed circuit**; heat resistance **epoxy polyimide adhesive**; migration prevention **epoxy polyimide adhesive**
- IT **Polyimides**, uses  
(**epoxy resin blends, adhesives, heat-resistant, for printed circuits**)
- IT **Epoxy resins**, uses  
(**polyimide blends, adhesives, heat-resistant, for printed circuits**)
- IT Heat-resistant materials  
(adhesives, **epoxy resin-polyimide blends, for printed circuits**)
- IT Siloxanes and Silicones, uses  
(di-Me, 3-(glycidyloxy)propyl Me, **epoxy resin-polyimide blends contg., KF 101, adhesives, for printed circuits**)
- IT Adhesives  
(heat-resistant, **epoxy resin-polyimide blends, for printed circuits**)
- IT **Polyimides**, uses  
(polyether-, **epoxy resin blends, adhesives, heat-resistant, for printed circuits**)
- IT Polyethers, uses  
(**polyimide-, epoxy resin blends, adhesives, heat-resistant, for printed circuits**)
- IT **Electric circuits**  
(**printed, adhesives for, epoxy resin-polyimide blends as, heat-resistant**)
- IT 61128-24-3, Ultem 1000 61128-46-9 124538-43-8 124661-69-4  
147835-34-5 147965-59-1  
(**epoxy resin blends, adhesives, heat-resistant, for printed circuits**)
- IT 7440-50-8, Copper, uses  
(foils, adhesives for, **epoxy resin-polyimide blends as, for printed circuits**)

IT 25068-38-6, Epikote 828  
(polyimide blends, adhesives, heat-resistant, for printed circuits)

=> d l91 1-22 cbib abs hitind

L91 ANSWER 1 OF 22 HCAPLUS COPYRIGHT 2003 ACS  
2003:15529 Document No. 138:74285 Liquid **epoxy** resin compositions with good reflow crack resistance and semiconductor devices sealed therewith. Hino, Hirohisa; Kanekawa, Naoki (Matsushita Electric Works, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2003002949 A2 20030108, 10 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-192400 20010626.

AB The compns. comprise (A) **cyanate** esters contg. 10-100% 4,4'-ethylidene bisphenylene **cyanate** (I), (B) **epoxy** resins contg. liq. (at room temps.) .gtoreq.10% naphthalene-contg. **epoxy** resins, (C) 60-95% inorg. fillers, and (D) metal chelates and/or metal salts satisfying a wt. ratio of A/B 0.76-1.43. Thus, a compn. contg. AroCy L 10 (I) 100, HP 4032D (1,6-dihydroxynaphthalene diglycidyl ether) 30, YD 8125 (bisphenol A **epoxy** resin) 70, QS 9 (fused silica) 573, Fe (III) **acetylacetonate** 0.5, Al (III) **acetylacetonate** 0.2, BYK 323 (aralkyl-modified Me polysiloxane, defoamer) 4.1, Epiclon B 650 (methylhexahydrophthalic anhydride) 20, and XE 5818 (silicone gel) 25 parts was applied on a substrate and cured to give a test board with good heat moisture and thermal shock resistance.

IC ICM C08G059-20  
ICS C08G059-40; H01L023-29; H01L023-31

CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 76

ST liq **epoxy** resin semiconductor packaging silicone gel; **cyanate** ethylidene phenylene methylhydrophthalic anhydride crosslinking agent; hydroxynaphthalene glycidyl bisphenol **epoxy** resin; crosslinking catalyst iron aluminum **acetylacetonate**; defoamer aralkyl methyl polysiloxane **epoxy** resin

IT Polysiloxanes, uses  
(Me, aralkyl-modified, BYK 323, defoamers; liq. **epoxy** resin compns. with good reflow crack resistance for packaging semiconductor devices)

IT Silicone rubber, uses  
(XE 5818; liq. **epoxy** resin compns. with good reflow crack resistance for packaging semiconductor devices)

IT **Epoxy** resins, uses  
(crosslinked; liq. **epoxy** resin compns. with good reflow crack resistance for packaging semiconductor devices)

IT Anhydrides  
(crosslinking agents; liq. **epoxy** resin compns. with good reflow crack resistance for packaging semiconductor devices)

IT Chelates

- Salts, uses  
 (crosslinking catalysts; liq. **epoxy** resin compns. with good reflow crack resistance for packaging semiconductor devices)
- IT Crosslinking agents  
 Crosslinking catalysts  
**Electronic packaging materials**  
 Semiconductor devices  
 (liq. **epoxy** resin compns. with good reflow crack resistance for packaging semiconductor devices)
- IT Antifoaming agents  
 (solvent-free silicone oils; liq. **epoxy** resin compns. with good reflow crack resistance for packaging semiconductor devices)
- IT 7631-86-9, QS 9, uses  
 (colloidal, inorg. fillers; liq. **epoxy** resin compns. with good reflow crack resistance for packaging semiconductor devices)
- IT 1156-51-0, AroCy B 10 25550-51-0, Epiclon B 650 26590-20-5, Epiclon B 570 47073-92-7, AroCy L 10  
 (crosslinking agent; liq. **epoxy** resin compns. with good reflow crack resistance for packaging semiconductor devices)
- IT 13963-57-0 14024-18-1, Iron (III)  
**acetylacetonate**  
 (crosslinking catalysts; liq. **epoxy** resin compns. with good reflow crack resistance for packaging semiconductor devices)
- IT 480432-80-2P 480432-81-3P 480432-83-5P  
 (liq. **epoxy** resin compns. with good reflow crack resistance for packaging semiconductor devices)

L91 ANSWER 2 OF 22 HCAPLUS COPYRIGHT 2003 ACS

2002:728696 Document No. 137:264017 Manufacture of high-inorganic-filled resin-clad copper foil with good adhesion. Ikekuchi, Nobuyuki; Shimoda, Masahiro (Mitsubishi Gas Chemical Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002273823 A2 20020925, 10 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-76188 20010316.

AB The resin-clad copper foil useful for high d. **printed circuit boards** is manufd. by (a) forming a B-stage prepreg by impregnating and curing a thermosetting resin contg. 10-79% insulative inorg. fillers onto a base substrate, (b) forming a B-stage sheet by applying a thermosetting resin contg. 80-99% insulative inorg. fillers on a thermoplastic film, (c) forming a B-stage layer on the matte surface of a Cu foil, and (d) placing the B-stage layers of (a) and (c) sep. on resp. sides of the prepreg and integrating thereon together, where the inorg. fillers have av. particle size 4-30  $\mu\text{m}$  and sp. surface area 0.3-1  $\text{m}^2/\text{g}$ . A varnish contained 2,2-bis(4-cyanatophenyl)propane (I) 15, I prepolymer 13, bisphenol F **epoxy** resin (EXA 830LVP) 22, DEN 431 50, Fe **acetylacetonate** 0.08, 2-ethyl-4-methylimidazole 0.5, A 187 2, Ba titanate 150 (or 950 parts for the second varnish for the PET film and Cu foil). A B-stage resin-coated PET film, a B-stage resin-coated Cu foil, and a B-stage resin-impregnated nonwoven glass.



fabric prepreg were prepd. and hot pressed to give a Cu-clad laminate, showing good thermal shock resistance, no void, and Cu foil adhesion 0.69 kgf/cm.

- IC ICM B32B015-08  
ICS B32B015-08; B32B031-12; C08J005-24; H05K003-00; C08L087-00  
CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 76  
ST inorg filled resin laminate copper foil adhesion; **printed circuit board** multilayer copper laminate  
IT **Printed circuit boards**  
(manuf. of high-inorg.-filled resin-clad copper foil with good adhesion)  
IT **Epoxy** resins, uses  
(manuf. of high-inorg.-filled resin-clad copper foil with good adhesion)  
IT **372488-70-5P 372488-71-6P 389800-15-1P 462100-71-6P**  
(manuf. of high-inorg.-filled resin-clad copper foil with good adhesion)

L91 ANSWER 3 OF 22 HCAPLUS COPYRIGHT 2003 ACS  
2002:728695 Document No. 137:264016 High-inorganic-filled resin-clad copper foil with good adhesion. Ikeguchi, Nobuyuki (Mitsubishi Gas Chemical Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002273821 A2 20020925, 10 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-76189 20010316.

- AB The resin-clad copper foil useful for high d. **printed circuit boards** is manufd. by (a) forming a B-stage prepreg by impregnating and curing a thermosetting resin contg. 10-79% insulative inorg. fillers onto a base substrate, (b) forming a B-stage sheet by applying a thermosetting resin contg. 80-99% insulative inorg. fillers on a thermoplastic film, (c) forming a B-stage layer on the matte surface of a Cu foil, and (d) placing the B-stage layers of (a) and (c) sep. on resp. sides of the prepreg and integrating thereon together, where the inorg. fillers have av. particle size 4-30  $\mu\text{m}$  and sp. surface area 0.3-1  $\text{m}^2/\text{g}$ . A varnish contained 2,2-bis(4-cyanatophenyl)propane (I) 15, I prepolymer 13, bisphenol F **epoxy** resin (EXA 830LVP) 22, DEN 431 50, Fe **acetylacetonate** 0.08, 2-ethyl-4-methylimidazole 0.5, A 187 2, Ba titanate 150 (or 950 parts for the second varnish for the PET film and Cu foil). A B-stage resin-coated PET film, a B-stage resin-coated Cu foil, and a B-stage resin-impregnated nonwoven glass fabric prepreg were prepd. and hot pressed to give a Cu-clad laminate, showing good thermal shock resistance, no void, and Cu foil adhesion 0.69 kgf/cm.

- IC ICM B32B015-08  
ICS C08J005-24; C08K003-00; C08L063-00; C08L079-04; H05K001-03; H05K003-46  
CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 76  
ST inorg filled resin laminate copper foil adhesion; **printed circuit board** multilayer copper laminate

- IT Polyesters, uses  
(film; high-inorg.-filled resin-clad copper foil with good adhesion for high d. **printed circuit boards**)
- IT **Printed circuit boards**  
(high-inorg.-filled resin-clad copper foil with good adhesion for high d. **printed circuit boards**)
- IT **Epoxy resins, uses**  
(high-inorg.-filled resin-clad copper foil with good adhesion for high d. **printed circuit boards**)
- IT **Fillers**  
(inorg., particle size and surface area; high-inorg.-filled resin-clad copper foil with good adhesion for high d. **printed circuit boards**)
- IT 11115-71-2P, Bismuth titanate 12013-46-6P, Calcium stannate 12047-27-7P, Barium titanate, uses 13463-67-7P, Titanium oxide, uses  
(filler; high-inorg.-filled resin-clad copper foil with good adhesion for high d. **printed circuit boards**)
- IT 25038-59-9, PET polyester, uses  
(film; high-inorg.-filled resin-clad copper foil with good adhesion for high d. **printed circuit boards**)
- IT 372488-70-5P 372488-71-6P 389800-15-1P 462100-71-6P  
(high-inorg.-filled resin-clad copper foil with good adhesion for high d. **printed circuit boards**)
- IT 7440-50-8, Copper, uses  
(high-inorg.-filled resin-clad copper foil with good adhesion for high d. **printed circuit boards**)

L91 ANSWER 4 OF 22 HCAPLUS COPYRIGHT 2003 ACS  
2002:726792 Document No. 137:264011 Manufacture of high-inorganic-filled resin-clad copper foil with good adhesion. Ikekuchi, Nobuyuki (Mitsubishi Gas Chemical Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002273822 A2 20020925, 11 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-80882 20010321.

AB The resin-clad copper foil useful for high d. **printed circuit boards** is manufd. by (a) forming a B-stage prepreg by impregnating and curing a thermosetting resin contg. .ltoreq.79% insulative inorg. fillers onto a base substrate, (b) forming a B-stage sheet by applying a thermosetting resin contg. 80-99% insulative inorg. fillers on a Cu foil, (c) forming a unifacially Cu-clad laminate by applying the B-stage sheet onto the prepreg, and (d) placing a B-stage resin-laminated thermoplastic film on the resin side of the laminate from (c) and integrating thereon together, where the inorg. fillers have av. particle size 4-30 .mu.m and sp. surface area 0.3-1 m2/g. A varnish contained 2,2-bis(4-cyanatophenyl)propane (I) 15, I prepolymer 13, bisphenol F epoxy resin (EXA 830LVP) 22, DEN 431 50, Fe acetylacetonate 0.08, 2-ethyl-4-methylimidazole 0.5, A 187

2, Ba titanate 150 (or 950 parts for the second varnish for the PET film and Cu foil). A B-stage resin-coated PET film, a B-stage resin-coated Cu foil, and a B-stage resin-impregnated nonwoven glass fabric prepreg were prepd. and hot pressed to give a Cu-clad laminate, showing thickness fluctuation 2.9%, no void, and Cu foil adhesion 0.71 kgf/cm.

- IC ICM B32B015-08  
ICS B32B035-00; C08G059-18; C08G073-06; C08K003-24; C08L063-00; C08L079-04
- CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 76
- ST inorg filled resin laminate copper foil adhesion; **printed circuit board** multilayer copper laminate
- IT **Printed circuit boards**  
(manuf. of high-inorg.-filled resin-clad copper foil with good adhesion)
- IT **Epoxy** resins, uses  
(manuf. of high-inorg.-filled resin-clad copper foil with good adhesion)
- IT 372488-70-5P 372488-71-6P 389800-15-1P  
462100-71-6P  
(manuf. of high-inorg.-filled resin-clad copper foil with good adhesion)
- IT 7440-50-8, Copper, uses  
(**printed circuit board**; manuf. of high-inorg.-filled resin-clad copper foil with good adhesion)

L91 ANSWER 5 OF 22 HCAPLUS COPYRIGHT 2003 ACS

2002:708925 Document No. 137:233449 Relatively high dielectric constant B stage resin composition sheet and the **printed circuit board** made from the same. Ikekuchi, Nobuyuki (Mitsubishi Gas Chemical Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002265754 A2 20020918, 11 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-65824 20010309.

AB The compn. comprises a curing catalyst-added **epoxy** resin contg. 80-99% an insulating inorg. filler having dielec. const. >500, wherein, 1-75% of the filler is a needle-like insulating inorg. filler. Thus, a compn. for prepn. of sheet to make **circuit boards** with Cu foil was made from a mixt. of 2,2-bis(4-cyanatophenyl)propane (I) 15, a prepolymer of I 13, EXA 830LVP 22, DEN 431 50, iron **acetylacetonate** 0.08, 2-ethyl-4-methylimidazole 0.5, A 187 2, Ba titanate (II) ceramic 300, and needle-like II 267 parts.

- IC ICM C08L063-00  
ICS B32B027-38; C08J005-18; C08K003-00; C08K005-315; C08K007-00; C08L079-00; H05K001-03; H05K003-00
- CC 37-6 (Plastics Manufacture and Processing)  
Section cross-reference(s): 76
- ST dielec const **epoxy** phenolic **circuit board**; elec insulating filler **epoxy** resin
- IT Ceramics  
Electric insulators

**Printed circuit boards**

(relatively high dielec. const. B stage resin compn. sheet and the **printed circuit board** made from the same)

IT 11115-71-2, Bismuth titanate 12047-27-7, Barium titanate, uses  
12049-50-2, Calcium titanate 12060-00-3, Lead titanate  
12060-01-4, Lead zirconate 12060-59-2, Strontium titanate  
(ceramic; relatively high dielec. const. B stage resin compn.  
sheet and the **printed circuit board**  
made from the same)

IT 372488-70-5, 2,2-Bis(4-cyanatophenyl)propane-DEN 431-EXA  
830LVP copolymer 372488-71-6 389800-16-2  
401508-32-5

(relatively high dielec. const. B stage resin compn.  
sheet and the **printed circuit board**  
made from the same)

L91 ANSWER 6 OF 22 HCAPLUS COPYRIGHT 2003 ACS

2002:148790 Document No. 136:201256 Manufacture of prepregs useful for  
**printed circuit boards**. Ikeguchi,  
Nobuyuki; Shimoda, Masahiro (Mitsubishi Gas Chemical Co., Ltd.,  
Japan). Jpn. Kokai Tokkyo Koho JP 2002060514 A2 20020226, 10 pp.  
(Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-247251 20000817.

AB The prepregs are manufd. by applying thermosetting resin compns.  
contg. 10-99% elec. insulating inorg. filler powders on one side of  
thermoplastic films, drying the compns., and bonding the coated  
films to both sides of fiber fabric substrates so that the resin  
compn. layers face the substrates. Thus, a compn. contg.  
2,2-bis(4-cyanatophenyl)propane (I) 15, a prepolymer (av. mol. wt.  
1900) prepd. from I 13, EXA 830LVP (bisphenol F-based **epoxy**  
resin) 22, DEN 431 (novolak **epoxy** resin) 50, (  
**acetylacetonato**)iron 0.08, 2-ethyl-4-methylimidazole 0.5, A  
187 (epoxysilane coupling agent) 2, and Ba titanate dielec. ceramics  
400 parts was applied on one side of PET films, dried, and the films  
were bonded to both sides of liq.-cryst. polyester fiber nonwoven  
fabrics to give prepregs. PET films were released from the prepregs  
and the prepregs were stacked, laminated with Cu foils on both  
sides, and further processed to give a **printed**  
**circuit board** showing no voids, good bonding  
strength, and good heat and moisture resistance.

IC ICM C08J005-24

ICS B29C043-20; C08G059-50; C08K003-00; C08L063-00; B29K067-00;  
B29K079-00; B29K105-08; B29L031-34

CC 38-2 (Plastics Fabrication and Uses)

Section cross-reference(s): 76

ST prepreg dielec filler thermoplastic resin;  
**printed circuit prepreg cyanate ester**  
**epoxy**; liq cryst polyester fiber prepreg **epoxy**;  
barium titanate filler **cyanate epoxy** prepreg;  
heat moisture resistance prepreg **cyanate epoxy**

IT Electric insulators

(ceramic, fillers; manuf. of fiber-reinforced prepregs contg.

- dielec. fillers for **printed circuit boards**)
- IT Synthetic fibers  
(ceramic, nonwoven fabrics; manuf. of fiber-reinforced prepregs contg. dielec. fillers for **printed circuit boards**)
- IT Phenolic resins, uses  
(**epoxy**, novolak, dicyandiamide-crosslinked; manuf. of fiber-reinforced prepregs contg. dielec. fillers for **printed circuit boards**)
- IT **Polycyanurates**  
(**epoxy-phenolic-**, novolak; manuf. of fiber-reinforced prepregs contg. dielec. fillers for **printed circuit boards**)
- IT Phenolic resins, uses  
(**epoxy-polycyanurate-**, novolak; manuf. of fiber-reinforced prepregs contg. dielec. fillers for **printed circuit boards**)
- IT Ceramics  
(fibers, nonwoven fabrics; manuf. of fiber-reinforced prepregs contg. dielec. fillers for **printed circuit boards**)
- IT Reinforced plastics  
(glass fiber-reinforced, prepregs, thermosetting; manuf. of fiber-reinforced prepregs contg. dielec. fillers for **printed circuit boards**)
- IT Water-resistant materials  
(heat-resistant; manuf. of fiber-reinforced prepregs contg. dielec. fillers for **printed circuit boards**)
- IT Polyesters, uses  
(in manuf. of fiber-reinforced prepregs contg. dielec. fillers for **printed circuit boards**)
- IT Polyester fibers, uses  
(liq.-cryst., nonwoven fabrics; manuf. of fiber-reinforced prepregs contg. dielec. fillers for **printed circuit boards**)
- IT Nonwoven fabrics  
**Printed circuit boards**  
(manuf. of fiber-reinforced prepregs contg. dielec. fillers for **printed circuit boards**)
- IT Glass fiber fabrics  
(manuf. of fiber-reinforced prepregs contg. dielec. fillers for **printed circuit boards**)
- IT **Epoxy** resins, uses  
(phenolic, novolak, dicyandiamide-crosslinked; manuf. of fiber-reinforced prepregs contg. dielec. fillers for **printed circuit boards**)
- IT **Epoxy** resins, uses  
(phenolic-**polycyanurate-**, novolak; manuf. of fiber-reinforced prepregs contg. dielec. fillers for **printed circuit boards**)

- IT Reinforced plastics  
(polyester fiber-reinforced, thermosetting, prepregs; manuf. of fiber-reinforced prepregs contg. dielec. fillers for **printed circuit boards**)
- IT Liquid crystals, polymeric  
(polyesters, fibers, nonwoven fabrics; manuf. of fiber-reinforced prepregs contg. dielec. fillers for **printed circuit boards**)
- IT Reinforced plastics  
(prepregs, thermosetting, ceramic fiber-reinforced; manuf. of fiber-reinforced prepregs contg. dielec. fillers for **printed circuit boards**)
- IT Plastic films  
(thermo-; in manuf. of fiber-reinforced prepregs contg. dielec. fillers for **printed circuit boards**)
- IT Laminated plastics, uses  
(thermosetting; manuf. of fiber-reinforced prepregs contg. dielec. fillers for **printed circuit boards**)
- IT Heat-resistant materials  
(water-resistant; manuf. of fiber-reinforced prepregs contg. dielec. fillers for **printed circuit boards**)
- IT 11115-71-2, Bismuth titanate. 12013-46-6, Calcium tin oxide (CaSnO<sub>3</sub>) 12047-27-7, Barium titanate, uses 13463-67-7, Titanium dioxide, uses 187405-77-2, Barium calcium tin titanium oxide (dielec. ceramic filler; manuf. of fiber-reinforced prepregs contg. dielec. fillers for **printed circuit boards**)
- IT 25038-59-9, PET (polyester), uses  
(in manuf. of fiber-reinforced prepregs contg. dielec. fillers for **printed circuit boards**)
- IT 372488-70-5P, 2,2-Bis(4-cyanatophenyl)propane-DEN 431-EXA 830LVP copolymer 372488-71-6P 389800-16-2P 401508-32-5P  
(manuf. of fiber-reinforced prepregs contg. dielec. fillers for **printed circuit boards**)

L91 ANSWER 7 OF 22 HCAPLUS COPYRIGHT 2003 ACS

2002:112999 Document No. 136:152380 Manufacture of copper foils with fabric-reinforced B-stage resins. Ikekuchi, Nobuyuki (Mitsubishi Gas Chemical Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002046125 A2 20020212, 10 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-235136 20000803.

AB The process involves (i) applying a thermosetting resin compn. contg. 10-99% dielec. inorg. powder fillers on 1 side of peelable thermoplastic films and drying to be B-stage, (ii) placing them on both sides of a fabric substrate, (iii) peeling the films and placing Cu foils thereon, and (iv) laminating the substrate, resin layers, and Cu foils under heat and pressure. Even when the filler content is as high as 80-90%, the fillers will not ppt., thereby achieving high adhesion of Cu foils and the resins, reduced thermal

shrinkage, high strength, excellent via hole-forming processability with CO<sub>2</sub> laser, and high reliability in via contacts. Thus, a **printed circuit board** with dielec.

const. 25 (1 MHz) was made from Cu clad laminates of B-stage prepregs composed of (A) a nonwoven fabric of liq. cryst. polyester fibers and (B) a varnish comprising 2,2-bis(4-cyanatophenyl)propane (I) 15, I prepolymer 13, bisphenol F **epoxy** resin (EXA 830LVP) 22, novolak **epoxy** resin (DEN 431) 50, Fe acetylacetone 0.08, 2-ethyl-4-methylimidazole 0.5, an epoxysilane coupling agent (A 187) 2, and Ba titanate powders 400 parts.

- IC ICM B29B011-16
- ICS B32B015-08
- CC 38-3 (Plastics Fabrication and Uses)
- ST copper clad laminate B stage thermoset; **printed circuit board** copper clad laminate; **epoxy** B stage copper clad laminate; **cyanate epoxy** B stage prepreg copper laminate
- IT **Epoxy** resins, uses  
(**cyanate**-crosslinked; manuf. of Cu clad laminates of fabric-reinforced B-stage resins with high filler contents)
- IT Phenolic resins, uses  
(**epoxy**, novolak, cresolic; manuf. of Cu clad laminates of fabric-reinforced B-stage resins with high filler contents)
- IT Phenolic resins, uses  
(**epoxy**, novolak; manuf. of Cu clad laminates of fabric-reinforced B-stage resins with high filler contents)
- IT **Epoxy** resins, uses  
(manuf. of Cu clad laminates of fabric-reinforced B-stage resins with high filler contents)
- IT **Cyanates**  
**Polycyanurates**  
(manuf. of Cu clad laminates of fabric-reinforced B-stage resins with high filler contents)
- IT **Printed circuit boards**  
(multilayer; manuf. of Cu clad laminates of fabric-reinforced B-stage resins with high filler contents)
- IT **Epoxy** resins, uses  
(phenolic, novolak, cresolic; manuf. of Cu clad laminates of fabric-reinforced B-stage resins with high filler contents)
- IT **Epoxy** resins, uses  
(phenolic, novolak; manuf. of Cu clad laminates of fabric-reinforced B-stage resins with high filler contents)
- IT 931-36-2, 2-Ethyl-4-methylimidazole 14024-18-1, Iron acetylacetone  
(manuf. of Cu clad laminates of fabric-reinforced B-stage resins with high filler contents)
- IT 372488-70-5P, 2,2-Bis(4-cyanatophenyl)propane-DEN 431-EXA 830LVP copolymer 395682-29-8P 395682-30-1P 395682-31-2P  
(manuf. of Cu clad laminates of fabric-reinforced B-stage resins with high filler contents)

L91 ANSWER 8 OF 22 HCAPLUS COPYRIGHT 2003 ACS

2001:791930 Document No. 135:332335 Liquid **epoxy** resin compositions for sealing semiconductors, and their use in semiconductor devices and their manufacture. Hino, Hirohisa; Fukui, Taro; Kanekaw, Naoki; Kitamura, Kenji; Hashimoto, Shinji (Matsushita Electric Works, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2001302767 A2 20011031, 11 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-124646 20000425.

AB The compns. giving moisture- and heat-resistant cured products, comprise (A) **cyanate** esters, (B) **epoxy** resins, (C) inorg. fillers, (D) metal chelates and/or metal salts, and (E) dihydrazides and satisfy A and/or B in liq. state at room temp. and the following wt. ratios: C/(total compn.) 0.60-0.95; A/B 0.50-1.82; and E/[(total compn.) - C] 0.01-0.15. The devices are manufd. by injection molding the **epoxy** resin compns. with molds to seal semiconductors. Thus, a mixt. contg. AroCy L 10 (4,4'-ethylidenebisphenylene **cyanate**, liq. at room temp.) 100, YD 8125 (**epoxy** resin) 100, 2,4-dihydrazino-6-methylamino-sym-triazine 12, Fe(III) **acetylacetonate** 0.2, a coupling agent 11, and SiO<sub>2</sub> filler 335 parts had long pot life and was used to seal a Si chip and cured to give a test board showing high reliability in pressure cooker test for 400 h.

IC ICM C08G059-40  
ICS C08K003-00; C08K005-541; C08L063-00; C08L083-04; H01L023-29; H01L023-31

CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 37, 76

ST **epoxy** resin **cyanate** ester dihydrazide  
semiconductor sealant; iron **acetylacetonate** catalyst  
**epoxy polycyanurate** dihydrazide;  
dihydrazinomethylaminotriazine **epoxy** resin  
ethylidenebisphenylene **cyanate** crosslinking

IT Silicone rubber, uses  
(elasticity controller, XE 5818; liq. **epoxy** resin compns. contg. **cyanate** esters and dihydrazides for sealing semiconductors by injection molding)

IT Coupling agents  
(**epoxy** silane-type; liq. **epoxy** resin compns. contg. **cyanate** esters and dihydrazides for sealing semiconductors by injection molding)

IT **Polycyanurates**  
(**epoxy**, dihydrazide-crosslinked; liq. **epoxy** resin compns. contg. **cyanate** esters and dihydrazides for sealing semiconductors by injection molding)

IT Molding of plastics and rubbers  
(injection; liq. **epoxy** resin compns. contg. **cyanate** esters and dihydrazides for sealing semiconductors by injection molding)

IT **Electronic packaging** materials  
Semiconductor devices  
(liq. **epoxy** resin compns. contg. **cyanate** esters and dihydrazides for sealing semiconductors by injection



- molding)
- IT Naphthenic acids, uses  
(manganese salts, crosslinking catalyst; liq. **epoxy** resin compns. contg. **cyanate** esters and dihydrazides for sealing semiconductors by injection molding)
- IT Crosslinking catalysts  
(metal chelates or salts; liq. **epoxy** resin compns. contg. **cyanate** esters and dihydrazides for sealing semiconductors by injection molding)
- IT **Epoxy** resins, uses  
(**polycyanurate**-, dihydrazide-crosslinked; liq. **epoxy** resin compns. contg. **cyanate** esters and dihydrazides for sealing semiconductors by injection molding)
- IT 2530-83-8, A 187  
(coupling agent; liq. **epoxy** resin compns. contg. **cyanate** esters and dihydrazides for sealing semiconductors by injection molding)
- IT 14024-18-1, Iron(III) **acetylacetonate**  
21679-46-9, Cobalt(III) **acetylacetonate**  
(crosslinking catalyst; liq. **epoxy** resin compns. contg. **cyanate** esters and dihydrazides for sealing semiconductors by injection molding)
- IT 370070-09-0P 370070-10-3P 370070-11-4P  
370070-12-5P 370070-13-6P 370070-14-7P  
370070-15-8P  
(liq. **epoxy** resin compns. contg. **cyanate** esters and dihydrazides for sealing semiconductors by injection molding)
- L91 ANSWER 9 OF 22 HCAPLUS COPYRIGHT 2003 ACS  
2000:851294 Document No. 134:18356 Liquid **epoxy** resin compositions containing **cyanate** esters and silicones and semiconductor devices sealed therewith. Hino, Hirohisa; Fukui, Taro; Kitamura, Kenji (Matsushita Electric Works, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2000336246 A2 20001205, 10 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-146779 19990526.
- AB The compns. contain **cyanate** esters (A), **epoxy** resins (B), inorg. fillers (C), metal chelates and/or metal salts (D), and gelled silicones (E), where A and/or B is room-temp. liq. and wt. ratio of A/B = 0.76-1.43, C/(total compn.) = 0.60-0.95, and  $0.01 < F/(\text{total compn.} - C) < 0.3$ . Thus, a semiconductor device sealed with a 100:100:25:0.2:338 mixt. of AroCy L 10 [4,4'-ethylidenebis(phenylene **cyanate**)], YD 8125 (bisphenol A **epoxy** resin), XE 5818 (room-temp.-vulcanizing silicone), Fe **acetylacetonate**, and SiO<sub>2</sub> showed good heat and moisture resistance.
- IC ICM C08L063-00  
ICS C08K003-00; C08K005-09; C08K005-315; H01L023-29; H01L023-31; C08L063-00; C08L083-04
- CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 37, 76
- ST semiconductor packaging liq **epoxy** silicone blend; iron

**acetylacetonate** catalyst **polycyanurate**  
**epoxy** resin; acid anhydride amine crosslinking **epoxy**  
sealant

- IT Silicone rubber, uses  
(XE 5818; liq. **epoxy** resin compns. contg.  
**cyanate** esters and silicones for moisture-resistant  
semiconductor devices)
- IT **Polycyanurates**  
(**epoxy**; liq. **epoxy** resin compns. contg.  
**cyanate** esters and silicones for moisture-resistant  
semiconductor devices)
- IT Coupling agents  
Crosslinking catalysts  
**Electronic packaging** materials  
Semiconductor devices  
(liq. **epoxy** resin compns. contg. **cyanate**  
esters and silicones for moisture-resistant semiconductor  
devices)
- IT Naphthenic acids, uses  
(manganese salts; liq. **epoxy** resin compns. contg.  
**cyanate** esters and silicones for moisture-resistant  
semiconductor devices)
- IT **Epoxy** resins, uses  
(**polycyanurate**-; liq. **epoxy** resin compns.  
contg. **cyanate** esters and silicones for  
moisture-resistant semiconductor devices)
- IT 2530-83-8, A 187 61417-49-0, KR TTS  
(coupling agent; liq. **epoxy** resin compns. contg.  
**cyanate** esters and silicones for moisture-resistant  
semiconductor devices)
- IT 14024-18-1, Iron (III) **acetylacetonate**  
21679-46-9, Cobalt (III) **acetylacetonate**  
(liq. **epoxy** resin compns. contg. **cyanate**  
esters and silicones for moisture-resistant semiconductor  
devices)
- IT 300833-03-8P 309756-50-1P 309757-48-0P  
309757-50-4P 309757-53-7P 309757-54-8P  
309757-56-0P  
(liq. **epoxy** resin compns. contg. **cyanate**  
esters and silicones for moisture-resistant semiconductor  
devices)

L91 ANSWER 10 OF 22 HCAPLUS COPYRIGHT 2003 ACS  
2000:851293 Document No. 134:18355 Liquid **epoxy** resin  
compositions with low viscosity and moisture-resistant semiconductor  
devices sealed therewith. Hino, Hirohisa; Fukui, Taro; Kitamura,  
Kenji (Matsushita Electric Works, Ltd., Japan). Jpn. Kokai Tokkyo  
Koho JP 2000336245 A2 20001205, 10 pp. (Japanese). CODEN: JKXXAF.  
APPLICATION: JP 1999-146778 19990526.

AB The compns. contain **cyanate** esters (A), **epoxy**  
resins (B), inorg. fillers (C), metal chelates and/or metal salts  
(D), and room-temp. liq. acid anhydrides (E), where A and/or B is

room-temp. liq. and wt. ratio of C/(total compn.) = 0.60-0.95, A/B = 0.76-1.43, and E/(total compn. - C) = 0.01-0.3. Thus, a semiconductor device sealed with a 100:100:30:0.2:345 mixt. of AroCy L 10 [4,4'-ethylidenebis(phenylene **cyanate**)], YD 8125 (bisphenol A **epoxy** resin), Epiclon B 650 (methylhexahydrophthalic anhydride), Fe **acetylacetonate**, and SiO<sub>2</sub> showed good heat and moisture resistance.

- IC ICM C08L063-00  
ICS C08G059-42; C08K005-09; C08K005-315; H01L023-29; H01L023-31;  
C08L063-00; C08L083-04
- CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 37, 76
- ST moisture resistance semiconductor packaging liq **epoxy**;  
**cyanate** ester acid anhydride crosslinking **epoxy**;  
iron **acetylacetonate** trimerization catalyst  
**polycyanurate epoxy**
- IT Silicone rubber, uses  
(XE 5818; liq. **epoxy** resin compns. contg.  
**cyanate** esters and acid anhydrides for moisture-resistant  
semiconductor devices)
- IT **Polycyanurates**  
(**epoxy**; liq. **epoxy** resin compns. contg.  
**cyanate** esters and acid anhydrides for moisture-resistant  
semiconductor devices)
- IT Coupling agents  
Crosslinking catalysts  
**Electronic packaging** materials  
Semiconductor devices  
(liq. **epoxy** resin compns. contg. **cyanate**  
esters and acid anhydrides for moisture-resistant semiconductor  
devices)
- IT Naphthenic acids, uses  
(manganese salts; liq. **epoxy** resin compns. contg.  
**cyanate** esters and acid anhydrides for moisture-resistant  
semiconductor devices)
- IT **Epoxy** resins, uses  
(**polycyanurate**-; liq. **epoxy** resin compns.  
contg. **cyanate** esters and acid anhydrides for  
moisture-resistant semiconductor devices)
- IT 2530-83-8, A 187 61417-49-0, KR TTS  
(coupling agent; liq. **epoxy** resin compns. contg.  
**cyanate** esters and acid anhydrides for moisture-resistant  
semiconductor devices)
- IT 14024-18-1, Iron (III) **acetylacetonate**  
21679-46-9, Cobalt (III) **acetylacetonate**  
(liq. **epoxy** resin compns. contg. **cyanate**  
esters and acid anhydrides for moisture-resistant semiconductor  
devices)
- IT 309756-50-1P 309756-51-2P 309756-52-3P  
(liq. **epoxy** resin compns. contg. **cyanate**  
esters and acid anhydrides for moisture-resistant semiconductor  
devices)

L91 ANSWER 11 OF 22 HCAPLUS COPYRIGHT 2003 ACS

2000:585463 Document No. 133:179000 Curing catalysts, polymer compositions having high storage stability, semiconductor devices packaged with polymers, and coating materials. Murai, Shinji; Hayase, Shuji; Fujie, Shinetsu; Hayase, Rumiko; Hotta, Yasuyuki (Toshiba Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2000230038 A2 20000822, 78 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-169886 19990616. PRIORITY: JP 1998-170323 19980617; JP 1998-352908 19981211.

AB The catalysts comprise cationic polymn. catalysts and/or org. metal compds., where .gtoreq.1 of which can be reversibly dissolved and pptd. by heating and cooling, resp. Thus, a compn. contg. Epikote 828 and 3 parts S+(C6H4-p-OC18H37)3.cntdot.SbF6- showed gel time 20 s, no change after 12 mo., and giving cured products with bending strength 12 kg/mm2.

IC ICM C08G059-68

ICS C09D163-00; H01L023-29; H01L023-31

CC 42-9 (Coatings, Inks, and Related Products)

Section cross-reference(s): 38, 67, 76

ST curing catalyst **epoxy** resin storage stability;  
semiconductor device packaging material **epoxy** resin;  
coating storage stability **epoxy** resin; alkoxyphenylsulfur  
fluoroantimonate catalyst **epoxy** resin compn

IT Polymerization catalysts

(cationic; curing catalysts for **epoxy** resin compns.

with high storage stability for packaging semiconductor devices  
and coatings)

IT **Electronic packaging** materials

Semiconductor device fabrication

(curing catalysts for **epoxy** resin compns. with high  
storage stability for packaging semiconductor devices)

IT **Epoxy** resins, uses

(curing catalysts for **epoxy** resin compns. with high  
storage stability for packaging semiconductor devices and  
coatings)

IT Butadiene rubber, uses

(**epoxidized**, polymer with **epoxy** resins;  
curing catalysts for **epoxy** resin compns. with high  
storage stability for packaging semiconductor devices and  
coatings)

IT Crosslinking catalysts

(latent; curing catalysts for **epoxy** resin compns. with  
high storage stability for packaging semiconductor devices and  
coatings)

IT Phenolic resins, uses

(novolak, crosslinking agents; curing catalysts for **epoxy**  
resin compns. with high storage stability for packaging  
semiconductor devices and coatings)

IT Coating materials

(storage-stable; curing catalysts for **epoxy** resin  
compns. with high storage stability for coatings)

- IT 9003-17-2P  
(butadiene rubber, **epoxidized**, polymer with **epoxy** resins; curing catalysts for **epoxy** resin compns. with high storage stability for packaging semiconductor devices and coatings)
- IT 25068-38-6, Epikote 828 25085-98-7, Celloxide 2021  
159777-68-1, Epikote 806  
(crosslinked; curing catalysts for **epoxy** resin compns. with high storage stability for packaging semiconductor devices and coatings)
- IT 75-23-0 288-32-4D; Imidazole, drives. 87301-62-0, Adeka Opton CP  
66 149779-74-8, HX 3088 220932-46-7 288629-56-1 288629-57-2  
288629-60-7 288629-62-9 288629-63-0 288629-64-1 288629-65-2  
288629-66-3 288629-67-4 288629-68-5 288629-69-6 288629-70-9  
288629-71-0 288629-72-1 288629-73-2 288629-74-3 288629-75-4  
288629-76-5 288629-77-6  
(crosslinking catalyst; curing catalysts for **epoxy** resin compns. with high storage stability for packaging semiconductor devices and coatings)
- IT 80-09-1 603-35-0, uses 791-31-1 1965-09-9 13963-57-0  
15306-17-9 23328-87-2 61358-23-4 104185-25-3 113103-97-2  
125662-42-2 288629-33-4 288629-35-6 288629-36-7 288629-37-8  
288629-40-3 288629-47-0 288629-48-1 288629-50-5  
288629-51-6 288629-52-7 288629-53-8 288629-54-9  
288629-55-0  
(curing catalyst; curing catalysts for **epoxy** resin compns. with high storage stability for packaging semiconductor devices and coatings)
- IT 25085-98-7DP, Celloxide 2021A, polymer with **epoxidized** butadiene rubber 40364-42-9P  
53895-44-6P 130030-49-8P 202258-44-4P,  
1,1-Bis(4-cyanatophenyl)ethane-bisphenol A-epichlorohydrin copolymer  
208760-59-2P 220859-10-9P 288629-49-2P  
288629-58-3P 288629-59-4P 288631-73-2P  
288631-74-3P  
(curing catalysts for **epoxy** resin compns. with high storage stability for packaging semiconductor devices and coatings)

L91 ANSWER 12 OF 22 HCAPLUS COPYRIGHT 2003 ACS

2000:25663 Document No. 132:79350 **Epoxy** resin composition and electric insulating substrate made from the same. Okumoto, Satoshi; Okumoto, Chihiro (Matsushita Electric Works, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2000007763 A2 20000111, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-173011 19980619.

AB The compn. comprises an **epoxy** resin of a compd. having .gtoreq.2 **epoxy**/mol and a multifunctional **epoxy** compd., a phenol-modified polyphenylene ether, a **cyanate** and a curing accelerator. Thus, a compn. for prepn. of an **elec. circuit board** with glass fiber was made from DER 542 150 Epikote 1032H60 80, poly(2,6-di-Me-1,4-phenylene ether) 60, bisphenol A 8.2, benzoyl peroxide 4.5,

2,2-bis(4-cyanate phenyl) propane 62.5, Zn  
**acetylacetonate** 0.016 and 2-Et-4-imidazole 0.6 g in 100 g  
 toluene.

- IC ICM C08G059-62  
ICS H05K001-03
- CC 37-6 (Plastics Manufacture and Processing)
- ST bromobisphenol **epoxy elec circuit**  
**board**; polyphenylene **epoxy** polyurethane board
- IT **Printed circuit boards**  
 (epoxy resin compn. and elec. insulating substrate made  
 from the same)
- IT Polyurethanes, properties  
 Polyurethanes, properties  
 (epoxy, block, polyoxyphenylene-; epoxy resin  
 compn. and elec. insulating substrate made from the same)
- IT Polyoxyphenylenes  
 Polyoxyphenylenes  
 (epoxy, block; epoxy resin compn. and elec.  
 insulating substrate made from the same)
- IT **Epoxy resins, properties**  
**Epoxy resins, properties**  
 (polyoxyphenylene-, block; epoxy resin compn. and elec.  
 insulating substrate made from the same)
- IT **Epoxy resins, properties**  
**Epoxy resins, properties**  
 (polyurethane-, block, polyoxyphenylene-; epoxy resin  
 compn. and elec. insulating substrate made from the same)
- IT 253787-08-5 253787-09-6 253787-10-9  
 253787-11-0 253787-12-1 253787-13-2  
 (epoxy resin compn. and elec. insulating substrate made  
 from the same)

L91 ANSWER 13 OF 22 HCAPLUS COPYRIGHT 2003 ACS

1999:597005 Document No. 131:229779 Liquid injection-sealed under fill  
 material with low stress, good adhesion and rapid curability.  
 Sakamoto, Yushi; Wada, Masahiro (Sumitomo Bakelite Co., Ltd.,  
 Japan). Jpn. Kokai Tokkyo Koho JP 11256012 A2 19990921 Heisei, 7  
 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-60799  
 19980312.

AB The fill material esp. useful for semiconductor devices comprises  
 (A) a liq. **epoxy** resin contg. .gtoreq.30% reaction  
 products of GOR1SiMe2OSiMe2R2OG (I; G = glycidyl; R1, R2 = divalent  
 C1-5 aliph. group or C.gtoeq.6 arom. hydrocarbylene) and bisphenols  
 at equiv. ratio 1-5 and 120.degree., (B) **cyanate** esters,  
 and (C) spherical inorg. fillers. Heating I (R1, R2 = CH2CH2CH2;  
**epoxy** equiv 181) 100, bisphenol F 45, and  
 tetraphenylphosphonium tetraphenylborate 1 g at 180.degree. for 6 h,  
 kneading the reaction product 30, fused spherical silica (7.9 .mu.m)  
 32, synthetic spherical silica (0.3 .mu.m) 64 bisphenol F  
**epoxy** resin 30, p-NCOC6H4CHMeC6H4OCN-p, epoxysilane 0.5, and  
 Co (III) **acetylacetonate** 0.1 part and degassing gave an  
 under fill with initial viscosity 100 P, adhesion 8 kg/6 x 6 mm, and

- good thermal shock resistance.
- IC ICM C08L063-00  
ICS C08G059-30; C08K003-00; C08K005-16; H01L023-28; H01L023-29;  
H01L023-31
- CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 76
- ST injection sealed under fill material; semiconductor device under  
fill material; **epoxy** resin under fill material  
semiconductor
- IT **Electronic packaging** materials  
Semiconductor device fabrication  
(liq. injection-sealed under fill material with low stress, good  
adhesion and rapid curability)
- IT **Epoxy** resins, uses  
(liq. injection-sealed under fill material with low stress, good  
adhesion and rapid curability)
- IT 243865-51-2 243865-53-4  
(liq. injection-sealed under fill material with low stress, good  
adhesion and rapid curability)
- L91 ANSWER 14 OF 22 HCAPLUS COPYRIGHT 2003 ACS  
1999:298434 Document No. 130:353134 Thermosetting polymer compositions  
of **cyanate** esters, **epoxy** resins, and  
butadiene-alkyl methacrylate-styrene copolymer. Ikekuchi, Nobuyuki;  
Kato, Tadahiro; Aoto, Hiroki (Mitsubishi Gas Chemical Co., Ltd.,  
Japan). Jpn. Kokai Tokkyo Koho JP 11124491 A2 19990511 Heisei, 5  
pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-290956  
19971023.
- AB Title compns. useful for prepn. of **printed circuit**  
**boards** with improved heat resistance, elec. insulation  
property, migration resistance, and hardness, comprise 20-90%  
polyfunctional **cyanate** esters and prepolymers, 1-75%  
**epoxy** resins contg. .gtoreq.2 **epoxy**, 1-50%  
butadiene-alkyl methacrylate-styrene copolymers, and 0.005-5%  
thermosetting catalysts. Thus, 300 parts 2,2-bis(4-  
cyanatophenyl)propane was heated at 150.degree. for 6 h and  
dissolved in MEK to obtain a prepolymer soln., which was mixed with  
PT-30 (phenol novolak **cyanate** ester) 50, Paraloid EXL 2655  
(butadiene-Me methacrylate-styrene copolymer) 70, DEN 431 (  
**epoxy** resin) 230, ESCN 220F (cresol novolak **epoxy**  
resin) 350, Zn octylate 0.3, and 2-methyl-4-imidazole 1 part and  
applied on Cu foils. A Cu-clad **cyanate** resin (BT resin)  
laminate was patterned, sandwiched between the thus treated Cu  
foils, and then compression-molded to give a **printed**  
**circuit board** with adhesive strength 1.15  
(25.degree.) and 1.05 kg/cm (180.degree.), glass-transition temp.  
255.degree., no change after 5-h pressure cooker test, 0/160 cracks  
by 500 heat cycles (-65.degree./30 min, room temp./5 min,  
150.degree./30 min), dielec. const. 3.5 (1 MHz), and dielec. loss  
tangent 0.0145 (1 MHz).
- IC ICM C08L063-00  
ICS C08K007-16; C08L055-00; H05K001-03; C08G059-40

- CC 37-6 (Plastics Manufacture and Processing)  
Section cross-reference(s): 38, 76
- ST thermosetting **cyanate** resin compn **printed circuit**; polyfunctional **cyanate** ester prepolymer thermosetting compn; **epoxy** resin **cyanate** ester thermosetting compn; butadiene alkyl methacrylate styrene copolymer thermosetting; copper foil pretreatment thermosetting resin
- IT Electric insulators  
Heat-resistant materials  
**Printed circuit boards**  
(thermosetting compns. contg. **cyanate** ester prepolymers, **epoxy** resins, and butadiene-methacrylate-styrene copolymer for manuf. of **printed circuit boards**)
- IT Plastics, uses  
(thermosetting; thermosetting compns. contg. **cyanate** ester prepolymers, **epoxy** resins, and butadiene-methacrylate-styrene copolymer for manuf. of **printed circuit boards**)
- IT 557-09-5, Zinc octylate 930-62-1, 2,4-Dimethylimidazole 14024-18-1, Iron **acetylacetonate**  
(polymn. catalysts; thermosetting compns. contg. **cyanate** ester prepolymers, **epoxy** resins, and butadiene-methacrylate-styrene copolymer for manuf. of **printed circuit boards**)
- IT 224577-40-6P 225108-48-5P  
(thermosetting compns. contg. **cyanate** ester prepolymers, **epoxy** resins, and butadiene-methacrylate-styrene copolymer for manuf. of **printed circuit boards**)
- L91 ANSWER 15 OF 22 HCAPLUS COPYRIGHT 2003 ACS  
1999:250350 Document No. 130:312956 Liquid underfill materials for flip-chip semiconductor devices. Wada, Masahiro; Takeda, Toshiro (Sumitomo Bakelite Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 11106481 A2 19990420 Heisei, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-276757 19971009.
- AB Underfill materials with excellent humidity and thermal shock resistance comprise (A) 100 parts of ambient-temp.-liq. **epoxy** resins, (B) x parts of MeCH(p-C<sub>6</sub>H<sub>4</sub>OCN)<sub>2</sub> (I) and y parts of R<sub>3</sub>(QOCN)<sub>2</sub> (Q = 3- and/or 5-C<sub>10</sub>H<sub>17</sub>-alkyl-substituted 1,4-phenylene; R<sub>3</sub> = C<sub>10</sub>H<sub>17</sub>-alkylene) satisfying x + y = 100-150 and x/(x + y) = 0.15-0.5, (C) 5-30 parts 4,4'-dihydroxydiphenyl (II), (D) 0.3-2 parts imidazoles, (E) metal complex catalysts, and (F) spherical inorg. fillers. Thus, a compn. comprising a bisphenol F-type **epoxy** resin 100, II 10, I 75, bis(3,5-dimethyl-4-cyanatophenyl)methane 50, 2-undecylimidazole 0.5, an **epoxy** silane coupling agent 0.5, Co(III) **acetylacetonate** 0.25 part, 20% of spherical fused SiO<sub>2</sub> (av. 7.9 . $\mu$ m, .ltoreq.40 . $\mu$ m), and 40% of spherical synthetic SiO<sub>2</sub> (av. 0.3 . $\mu$ m, .ltoreq.4 . $\mu$ m) was poured into a flip-chip package and cured at 120.degree. for 1 h and at 150.degree. for 1 h to show good filling property and no



cracks of the package after 1000 cycles of thermal shock test (-65.degree./5 min and +150.degree./5 min) or after moistening (JEDEC level 3) and IR reflow soldering.

- IC ICM C08G059-62  
ICS C08G059-68; C08K003-00; C08L063-00; H01L023-29; H01L023-31  
CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 76  
ST **epoxy resin cyanate** dihydroxydiphenyl sealant  
semiconductor; thermal shock resistance flip chip underfill;  
humidity resistance semiconductor potting **epoxy resin**  
IT **Polycyanurates**  
**Polycyanurates**  
(**epoxy**; liq. **epoxy resin-dicyanate**  
-dihydroxydiphenyl compn.-based underfill materials for flip-chip  
semiconductor devices with good humidity and thermal shock  
resistance)  
IT **Electronic packaging materials**  
Potting compositions  
(liq. **epoxy resin-dicyanate**-dihydroxydiphenyl  
compn.-based underfill materials for flip-chip semiconductor  
devices with good humidity and thermal shock resistance)  
IT **Epoxy resins, uses**  
**Epoxy resins, uses**  
(**polycyanurate**-; liq. **epoxy resin-**  
**dicyanate**-dihydroxydiphenyl compn.-based underfill  
materials for flip-chip semiconductor devices with good humidity  
and thermal shock resistance)  
IT **223608-87-5P**  
(liq. **epoxy resin-dicyanate**-dihydroxydiphenyl  
compn.-based underfill materials for flip-chip semiconductor  
devices with good humidity and thermal shock resistance)  
IT 7631-86-9, Silica, uses 60676-86-0, Fused silica  
(spherical; liq. **epoxy resin-dicyanate**  
-dihydroxydiphenyl compn.-based underfill materials for flip-chip  
semiconductor devices with good humidity and thermal shock  
resistance)

L91 ANSWER 16 OF 22 HCAPLUS COPYRIGHT 2003 ACS

1999:250349 Document No. 130:312955 Liquid underfill materials for  
flip-chip semiconductor devices. Wada, Masahiro; Taketa, Toshio  
(Sumitomo Bakelite Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP  
11106480 A2 19990420 Heisei, 6 pp. (Japanese). CODEN: JKXXAF.  
APPLICATION: JP 1997-276756 19971009.

- AB Underfill materials with excellent humidity and thermal shock  
resistance comprise (A) 100 parts of ambient-temp.-liq.  
**epoxy resins**, (B) x parts of MeCH(p-C6H4OCN)2 (I) and y  
parts of R3(QOCN)2 (Q = 3- and/or 5-C.ltoreq.10-alkyl-substituted  
1,4-phenylene; R3 = C.ltoreq.10 alkylene) satisfying  $x + y = 100-150$   
and  $x/(x + y) = 0.15-0.5$ , (C) 5-30 parts tetramethylbisphenol A  
(II), (D) 0.3-2 parts imidazoles, (E) metal complex catalysts, and  
(F) spherical inorg. fillers. Thus, a compn. comprising a bisphenol  
F-type **epoxy resin** 100, II 10, I 75, bis(3,5-dimethyl-4-

cyanatophenyl)methane 50, 2-undecylimidazole 0.5, an **epoxy** silane coupling agent 0.5, Co(III) **acetylacetonate** 0.25 part, 20% of spherical fused SiO<sub>2</sub> (av. 7.9 . $\mu$ m, .ltoreq.40 . $\mu$ m), and 40% of spherical synthetic SiO<sub>2</sub> (av. 0.3 . $\mu$ m, .ltoreq.4 . $\mu$ m) was poured into a flip-chip package and cured at 120.degree. for 1 h and at 150.degree. for 1 h to show good filling property and no cracks of the package after 1000 cycles of thermal shock test (-65.degree./5 min and +150.degree./5 min) or after moistening (JEDEC level 3) and IR reflow soldering.

- IC ICM C08G059-62
- ICS C08G059-68; C08K003-00; C08L063-00
- CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 76
- ST **epoxy** resin **cyanate** tetramethylbisphenol sealant  
semiconductor; thermal shock resistance flip chip underfill;  
humidity resistance semiconductor potting **epoxy** resin
- IT **Polycyanurates**  
    **Polycyanurates**  
        (**epoxy**; liq. **epoxy** resin-**dicyanate**  
          -tetramethylbipshenol A compn.-based underfill materials for  
          flip-chip semiconductor devices with good humidity and thermal  
          shock resistance)
- IT **Electronic packaging** materials  
Potting compositions  
    (liq. **epoxy** resin-**dicyanate**  
      -tetramethylbipshenol A compn.-based underfill materials for  
      flip-chip semiconductor devices with good humidity and thermal  
      shock resistance)
- IT **Epoxy** resins, uses  
    **Epoxy** resins, uses  
        (**polycyanurate**-; liq. **epoxy** resin-  
          **dicyanate**-tetramethylbipshenol A compn.-based underfill  
          materials for flip-chip semiconductor devices with good humidity  
          and thermal shock resistance)
- IT 223608-63-7DP, **epoxy** resins, polymers with  
    **dicyanates** and tetramethylbisphenol A  
        (liq. **epoxy** resin-**dicyanate**  
          -tetramethylbipshenol A compn.-based underfill materials for  
          flip-chip semiconductor devices with good humidity and thermal  
          shock resistance)
- IT 7631-86-9, Silica, uses 60676-86-0, Fused silica  
    (spherical; liq. **epoxy** resin-**dicyanate**  
      -tetramethylbipshenol A compn.-based underfill materials for  
      flip-chip semiconductor devices with good humidity and thermal  
      shock resistance)

L91 ANSWER 17 OF 22 HCAPLUS COPYRIGHT 2003 ACS  
 1998:693542 Document No. 130:25998 **Cyanate** ester  
 polymer-containing liquid **epoxy** compositions and  
 semiconductor devices sealed with them. Motoori, Susumu (Mitsubishi  
 Gas Chemical Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 10287809  
 A2 19981027 Heisei, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION:

JP 1997-96039 19970414.

- AB The compns. comprise (A) **cyanate** ester polymers 25-60, (B) liq. **epoxy** resin 35-70, (C) **epoxy**-contg. silicone oils which are pre-mixed with the **cyanate** ester polymers before use, 0.1-5 parts, (D) 0.1-5 phr (based on A+B+C) metal chelate or metal salt-type curing catalysts, and (E) 100-900 phr fillers. Thus, a compn. contg. a **cyanate** ester prepolymer (viscosity 0.10 P at 100.degree.) 15, Epiclon 830LVP (a bisphenol F-type **epoxy** resin) 55, neopentyl glycol diglycidyl ether 15, and a mixt. of 2,2-bis(4-cyanatophenyl)propane and BY 16-855 (**epoxy**-terminated di-Me siloxane) 15 was blended with Fe acetylacetonate 1.0, A 187 2, spherical SiO<sub>2</sub> 400, and MA 100 0.5 part to give a liq. compn. which was applied on a Si chip, and cured at 160.degree. for 3 h to give a test piece showing high glass-transition temp., good adhesion, moisture and solder-heat resistances, and less warpage.
- IC ICM C08L079-00  
ICS C08L063-00; C08L083-06; H01L023-29; H01L023-31
- CC 38-3 (Plastics Fabrication and Uses) No  
Section cross-reference(s): 76
- ST **cyanate** ester polymer liq semiconductor sealing; bisphenol **epoxy** resin polycyanate **electronic packaging**; silicone oil **epoxy** polycyanate semiconductor sealant; metal chelate catalyst polycyanate **epoxy** compn; acetoacetate catalyst polycyanate **epoxy electronic packaging**; chelate catalyst polycyanate **epoxy electronic packaging**
- IT Crosslinking catalysts  
(chelating agents; **cyanate** ester polymer-based liq. compns. for sealing semiconductor devices)
- IT Chelates  
(crosslinking catalysts; **cyanate** ester polymer-based liq. compns. for sealing semiconductor devices)
- IT **Electronic packaging** materials  
(**cyanate** ester polymer-contg. liq. **epoxy** compns. and semiconductor devices sealed with them)
- IT Butadiene rubber, uses  
(**epoxidized**, E-1000-3.5; **cyanate** ester polymer-contg. liq. **epoxy** compns. and semiconductor devices sealed with them)
- IT Polysiloxanes, uses  
Polysiloxanes, uses  
(**epoxy**, SF 8411; crosslinked with **cyanate** ester and **epoxy** resins, liq. compns. for sealing semiconductor devices)
- IT Polysiloxanes, uses  
Polysiloxanes, uses  
(**epoxy**, polycyanate-; **cyanate** ester polymer-contg. liq. **epoxy** compns. and semiconductor devices sealed with them)
- IT Water-resistant materials  
Water-resistant materials

- (heat-resistant; **cyanate** ester polymer-contg. liq. **epoxy** compns. and semiconductor devices sealed with them)
- IT **Epoxy** resins, uses  
**Epoxy** resins, uses  
(polysiloxane-, SF 8411; crosslinked with **cyanate** ester and **epoxy** resins, liq. compns. for sealing semiconductor devices)
- IT **Epoxy** resins, uses  
**Epoxy** resins, uses  
(polysiloxane-, polycyanate-; **cyanate** ester polymer-contg. liq. **epoxy** compns. and semiconductor devices sealed with them)
- IT Heat-resistant materials  
Heat-resistant materials  
(water-resistant; **cyanate** ester polymer-contg. liq. **epoxy** compns. and semiconductor devices sealed with them)
- IT 9003-17-2  
(butadiene rubber, **epoxidized**, E-1000-3.5; **cyanate** ester polymer-contg. liq. **epoxy** compns. and semiconductor devices sealed with them)
- IT 14024-18-1  
(catalysts; **cyanate** ester polymer-contg. liq. **epoxy** compns. and semiconductor devices sealed with them)
- IT 1156-51-0DP, 2,2-Bis(4-cyanatophenyl)propane, polymers with **epoxy**-terminated siloxane, E 1000-3.5, and **epoxy** resins 17557-23-2DP, Neopentyl glycol diglycidyl ether, polymers with biscyanatophenylpropane, E 1000-3.5, Epiclon 830LVP, **epoxy**-terminated siloxane and neopentyl glycol diglycidyl ether 96141-20-7DP, Epiclon 830LVP, polymers with biscyanatophenylpropane, E 1000-3.5, **epoxy**-terminated siloxane and neopentyl glycol diglycidyl ether 190185-64-9DP, polymers with biscyanatophenylpropane, E 1000-3.5, and other **epoxy** resins 216220-24-5P 216220-25-6P  
(**cyanate** ester polymer-contg. liq. **epoxy** compns. and semiconductor devices sealed with them)
- IT 29357-35-5D, Rikaresin DME 100, polymers with biscyanatophenylpropane, **epoxy** siloxane, and other crosslinkers  
(**cyanate** ester polymer-contg. liq. **epoxy** compns. and semiconductor devices sealed with them)
- L91 ANSWER 18 OF 22 HCAPLUS COPYRIGHT 2003 ACS  
1998:651105 Document No. 129:331579 **Epoxy** resin compositions with improved heat resistance and low permittivity and low dielectric loss tangent. Okumoto, Satoshi; Kuroda, Kazuhiro (Matsushita Electric Works, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 10265669 A2 19981006 Heisei, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-71333 19970325.
- AB The compns. comprise **epoxy** compds. having .gtoreq.2 **epoxy** groups per mol., phenol-modified polyphenylene ethers prepd. by redistribution reaction of polyphenylene ethers with phenols in the presence of radical initiators, and **cyanate**

comps. as essential components and are useful for **printed circuit boards**. DER 542 [mixt. of bisphenol A **poxy** resin (I) and brominated I], phenol-modified polyphenylene ether [prepd. from poly(2,6-dimethyl-1,4-phenylene) ether and bisphenol A], and 2,2-bis(4-cyanatophenyl)propane were mixed with **acetylacetonatozinc**, 2-ethyl-4-imidazole, and PhMe to give a compn. Glass cloths were soaked with the compn. and pressed to give a laminate showing glass transition temp. 190.degree., permittivity 3.77, and tan .delta. 0.0063.

- IC ICM C08L079-00  
ICS C08L063-00; C08L071-12; C08G065-48 No
- CC 37-6 (Plastics Manufacture and Processing)  
Section cross-reference(s): 38, 76
- ST **epoxy** polyoxyphenylene heat resistance; dielec property  
**epoxy** polyoxyphenylene; **printed circuit board epoxy** resin laminate; bisphenol A  
**epoxy** laminate heat resistance; glass fabric **epoxy** laminate **circuit board**
- IT **Dielectric** properties  
Heat-resistant materials  
**Printed circuit boards**  
(**epoxy resin** compns. with improved heat resistance and low permittivity and low dielec. loss tangent)
- IT Polyoxyphenylenes  
Polyoxyphenylenes  
(**epoxy**; **epoxy resin** compns. with improved heat resistance and low permittivity and low dielec. loss tangent)
- IT Laminated materials  
(laminates of glass fiber fabrics with **epoxy resin** compns. with improved heat resistance and low permittivity and low dielec. loss tangent)
- IT Glass fiber fabrics  
(laminates with **epoxy resins**; **epoxy resin** compns. with improved heat resistance and low permittivity and low dielec. loss tangent for)
- IT **Epoxy resins**, preparation  
**Epoxy resins**, preparation.  
(polyoxyphenylene-; **epoxy resin** compns. with improved heat resistance and low permittivity and low dielec. loss tangent)
- IT 215094-11-4P, 2,2-Bis(4-cyanatophenyl)propane-bisphenol A-DER 542-2,6-Xylenol copolymer 215094-13-6P,  
Bis(3,5-dimethyl-4-cyanatophenyl)methane-bisphenol A-DER 542-2,6-Xylenol copolymer  
(**epoxy resin** compns. with improved heat resistance and low permittivity and low dielec. loss tangent)

L91 ANSWER 19 OF 22 HCAPLUS COPYRIGHT 2003 ACS

1988:23460 Document No. 108:23460 Curable powder compositions.

Kitagawa, Katsuji; Matsuo, Toshio; Akutagawa, Ichiro (Somar Corp., Japan). Jpn. Kokai Tokkyo Koho JP 62057420 A2 19870313 Showa, 6 pp.

- (Japanese). CODEN: JKXXAF. APPLICATION: JP 1985-194876 19850905.
- AB The title compns., useful as insulating coatings for elec. app., contain thermosetting resins contg. bismaleimides and cyanato group-contg. compds. as well as wollastonite (I). A mixt. of BT-2170 (thermosetting resin contg. bismaleimide and **cyanate** esters) 100, I (Kemolit ASB-3) 100, Zn **acetylacetonate** 0.2, dicumyl peroxide 0.5, silica 10, powd. polyethylene 2, synthetic mica 10, acrylic oligomer (XK-21) 0.1, and A-187 0.5 part was prepd. at 70-150.degree., cooled, and pulverized to give an 80-mesh powder which had gel time >500 s at 150.degree. and 136 s at 200.degree. and was coated (0.3-0.4 mm) on metal at 180.degree. and heated 60 min at 200.degree. to give an impact- and heat-resistant coating.
- IC ICM C08G073-06  
ICS C08G073-12; C08K003-00; C08L079-04; C08L079-08
- ICA C09D005-03
- ICI C08L079-04, C08L023-00; C08L079-08, C08L023-00
- CC 42-10 (Coatings, Inks, and Related Products)
- ST elec insulator maleimide **cyanate** resin; wollastonite resin  
elec insulator; impact strength thermoset insulator
- IT **Epoxy** resins, uses and miscellaneous No  
(elec. insulators contg. bismaleimides and **cyanate** esters and, heat- and impact-resistant)
- IT Impact strength  
(elec. insulators with high, resins contg. bismaleimides and **cyanate** esters for)
- IT Heat-resistant materials  
(thermosetting resins contg. bismaleimides and **cyanate** esters, elec. insulating)
- IT Electric insulators and **Dielectrics**  
(thermosetting **resins** contg. bismaleimides and **cyanate** esters, heat- and impact-resistant)
- IT 83381-87-7, BT-2170 112141-66-9  
112141-67-0 112141-68-1 112141-69-2  
112141-70-5 112141-71-6  
(elec. insulating coatings contg., heat- and impact-resistant)
- L91 ANSWER 20 OF 22 HCAPLUS COPYRIGHT 2003 ACS
- 1987:535431 Document No. 107:135431 Heat-resistant insulators for coils. Nagai, Shunichi; Mogi, Masakazu (Mitsubishi Gas Chemical Co., Inc., Japan). Jpn. Kokai Tokkyo Koho JP 61278113 A2 19861209 Showa, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1985-119960 19850603.
- AB Compns. prepd. from polyfunctional **cyanate** compds., polyfunctional maleimide compds., **epoxy** resins, inorg. fillers, and catalysts have good processability, have good heat resistance and dielec. properties after curing, and are useful as insulators for elec. motors, transformers, etc. A powder contg. 90:10 2,2-bis(4-cyanatophenyl)propane-bis(4-maleimidophenyl)methane copolymer 50, novolak **epoxy** resin (ECN-1273) 50, wollastonite 100, Zn **acetylacetonate** 0.1, and tert-Bu2O2 2.0 parts was impregnated in a motor coil and cured 5 min at

- 170.degree. and 30 min at 200.degree..
- IC ICM H01F027-32  
ICS H01B003-40; H02K003-30
- CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 76
- ST **cyanate** maleimide **epoxy** insulator; elec  
insulator coil; wollastonite **epoxy** elec insulator; heat  
resistance coil insulator
- IT Electric insulators and **Dielectrics**  
(**epoxy resins** contg. **cyanate-imide**  
resins, for coils)
- IT Electric coils  
(insulators for, **epoxy resins** contg. **cyanate**  
-imide resins as)
- IT 29690-82-2, ECN-1273 90967-47-8 103735-72-4, Epiclon  
N-880  
(**cyanate-imide** resin contg., for insulating elec.  
coils)
- IT 68508-55-4 109521-57-5  
(**epoxy** resin contg., for insulating elec. coils)
- IT 13983-17-0, Wollastonite  
(fillers, **epoxy** resin contg. **cyanate-imide**  
resin and, for coil insulation)
- L91 ANSWER 21 OF 22 HCAPLUS COPYRIGHT 2003 ACS  
1986:516190 Document No. 105:116190 Moldings for **printed**  
**circuit boards**. Kan, Morio; Nagai, Shunichi;  
Mogi, Masakazu (Mitsubishi Gas Chemical Co., Inc., Japan). Jpn.  
Kokai Tokkyo Koho JP 61094755 A2 19860513 Showa, 8 pp. (Japanese).  
CODEN: JKXXAF. APPLICATION: JP 1984-215666 19841015.
- AB Moldings for **printed circuit boards**  
with excellent heat resistance, dielec. properties, heat cond., and  
processability are prepd. by hot-pressing a sheet made from a mixt.  
of 10-40 parts **cyanate** ester resin of no.-av. mol. wt.  
(Mn) .ltoreq.2500, 60-90 parts inorg. filler, and a crosslinking  
catalyst on .gtoreq.1 sides with metal foils. Thus,  
2,2-bis(4-cyanatophenyl)propane was heated 480 min at 150.degree. to  
give a resin (I) of Mn 600. A mixt. of I 100, fused silica powder  
400, and Fe **acetylacetonate** 0.1 g was pressed by rolls to  
give a 0.85-mm sheet, which was pressed on both sides with 35-.mu.  
electrolytic Cu foil at 170.degree. and 5 kg/cm<sup>2</sup> for 3 min to give a  
0.8-mm laminate with peel strength 1.8 kg/cm, glass transition temp.  
220.degree., dielec. const. (1 MHz) 3.5, dielec. loss tan 18 .times.  
10<sup>-4</sup> (1 MHz).
- IC ICM B32B015-08  
ICS H05K001-03
- CC 38-3 (Plastics Fabrication and Uses)
- ST polybiscyanatophenylpropane sheet copper foil laminate; copper foil  
**printed circuit board**
- IT Polyamide fibers, uses and miscellaneous  
(cloth, woven, laminate with **cyanate** polymer sheet and  
metal foil, for **printed circuit**

- boards)  
 IT **Electric circuits**  
     (printed, boards, cyanate  
       resin-metal foil laminates for)  
 IT Glass fibers, uses and miscellaneous  
     (textiles, woven, laminate with **cyanate** polymer sheet  
     and metal foil, for **printed circuit**  
     boards)  
 IT 14808-60-7, uses and miscellaneous  
     (cloth, woven, laminate with **cyanate** polymer sheet and  
     metal foil, for **printed circuit**  
     boards)  
 IT 7440-50-8, uses and miscellaneous  
     (foils, **cyanate** polymer sheet laminates, for  
     **printed circuit boards**)  
 IT 7439-89-6, uses and miscellaneous  
     (foils, cyanic acid ester sheet laminates, for **printed**  
     **circuit boards**)  
 IT 9002-88-4 9003-17-2 25068-38-6 25722-66-1  
     68508-55-4  
     (sheets, metal foil laminates, for **printed**  
     **circuit boards**)
- L91 ANSWER 22 OF 22 HCAPLUS COPYRIGHT 2003 ACS  
 1982:105452 Document No. 96:105452 Electric insulator prepregs.  
 (Mitsubishi Electric Corp., Japan). Jpn. Kokai Tokkyo Koho JP  
 56159014 A2 19811208 Showa, 6 pp. (Japanese). CODEN: JKXXAF.  
 APPLICATION: JP 1980-62470 19800509.
- AB Elec. insulator prepregs with excellent pot life were prepd. from an  
**epoxy** resin, a bismaleimide-triazine resin, and a carbonyl  
 compd. metal complex. For example, a varnish from Epon 834 [   
 25068-38-6] 60, DEN 438 [63957-64-2] 20, BT 2100  
 [75603-38-2] 20, manganese(III) **acetylacetonate**  
 [14284-89-0] 0.2, acetone 35, EtOH 10, and toluene 55  
 parts was coated to 150 g solids/m<sup>2</sup> on 0.13 mm-thick glass fabric  
 and cured at 110.degree. for 10 min to give a prepreg (resin content  
 58%) with pot life (20.degree., 50% relative humidity) >6 mo, gel  
 time (170.degree.) 2.8 min, bending strength (cured 20-ply laminate)  
 60 and 36 kg/mm<sup>2</sup> at 20.degree. and 180.degree., resp., tan  $\delta$ .  
 0.50 and 1.20% at 20.degree. and 200.degree., resp., and breakdown  
 31.6 and 28.5 kV/mm initially and after 20 days at 230.degree.,  
 resp., compared with 3, 1.5, 48, 10, 0.7, >30, 26.5, and 17.0,  
 resp., for a control using an impregnant from Epon 828 45, DEN 438  
 55, BF<sub>3</sub>.cntdot.EtNH<sub>2</sub> 3, acetone 50, and toluene 50 parts.
- IC H01B017-60; H01F041-12  
 ICA B29D003-02; B32B005-28; B32B019-06; C08J005-24  
 CC 38-3 (Plastics Fabrication and Uses)  
 ST **epoxy** prepreg elec insulator; maleimide resin elec  
 insulator; triazine resin elec insulator; manganese  
**acetylac tonate** crosslinking catalyst; glass fiber  
**epoxy** prepreg  
 IT Glass fibers, uses and miscellaneous



- (**epoxy** preregs, contg. bismaleimide-triazine resin,  
for elec. insulators)
- IT Electric insulators and **Dielectrics**  
(**epoxy resin**-glass fiber preregs for)
- IT **Epoxy** resins, uses and miscellaneous  
(glass fiber-reinforced, preregs, contg. bismaleimide-triazine  
resin, for elec. insulators)
- IT Crosslinking catalysts  
(manganese **acetylacetonate**, for **epoxy**  
preregs)
- IT **14284-89-0**  
(crosslinking catalysts, for **epoxy** preregs)
- IT 541-59-3D, bis derivs., polymers  
(**epoxy** preregs contg., for elec. insulators)
- IT **75603-38-2**  
(**epoxy**-glass fiber preregs contg., for elec.  
insulators)
- IT **25068-38-6 63957-64-2**  
(glass fiber-reinforced, preregs, for elec. insulators)